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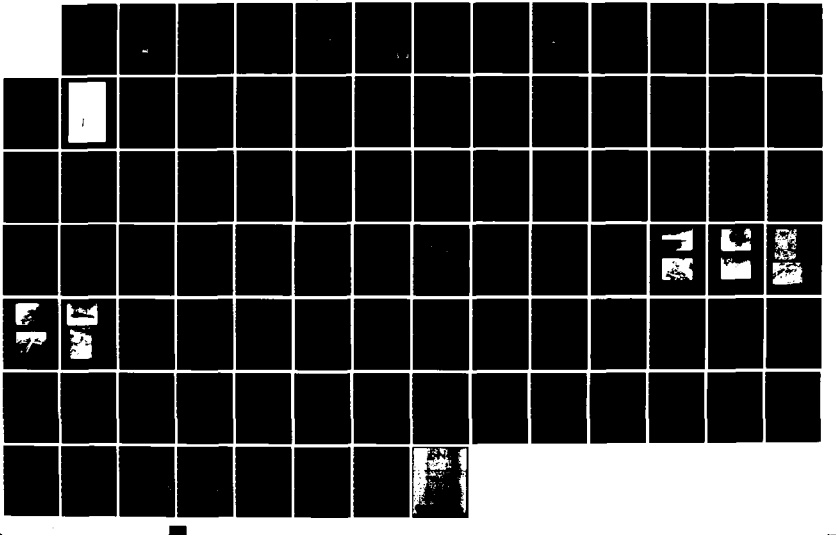

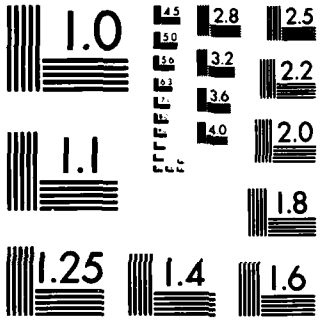

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HOUSATONIC RIVER BASIN

SHARON, CONNECTICUT

HATCH POND DAM
CT 00603

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

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4. TITLE *(and Subtitle)* Hatch Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
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Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

DAMS, INSPECTION, DAM SAFETY,

Housatonic River Basin
Sharon, Connecticut

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The Hatch Pond Dam consists of an earth embankment with a maximum height of 31 ft., a top width of 12 feet, and an overall length of 340 feet, including a 41.5 foot long overflow spillway located at the right end of the dam. Based onthe visual inspection, the dam is judged to be in fair condition. The dam is classified as "Small" in size with a "High" hazard potential. A test equal to ½ the PMF was selected.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:
NEDED-E

JAN 21 1981

Honorable William A. O'Neill
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor O'Neill:

Inclosed is a copy of the Hatch Pond Dam (CT-00603) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. The report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis. A brief assessment is included at the beginning of the report.

The preliminary hydrologic analysis has indicated that the spillway capacity for the Hatch Pond Dam would likely be exceeded by floods greater than 20 percent of the Probable Maximum Flood (PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

The term "unsafe" applied to a dam because of an inadequate spillway does not indicate the same degree of emergency as that term would if applied because of structural deficiency. It does indicate, however, that a severe storm may cause overtopping and possible failure of the dam, with significant damage and potential loss of life downstream.

It is recommended that within twelve months from the date of this report the owner of the dam engage the services of a professional or consulting engineer to determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, round-the-clock surveillance should be provided.

JAN 21 1981

NEDED-E
Honorable William A. O'Neill

I have approved the report and support the findings and recommendations described in Section 7, with qualifications as noted above. I request that you keep me informed of the actions taken to implement these recommendations since this follow-up is an important part of the non-Federal Dam Inspection Program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. This report has also been furnished to the owner of the project, The Estate of Harold A. Hatch, Howard R. Patch, Jr., Owners Representative, Vice President, The Irving Trust Co., 1 Wall Street, New York, New York.

Copies of this report will be made available to the public, upon request to this office, under the Freedom of Information Act, thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for the cooperation extended in carrying out this program.

Sincerely,

WILLIAM E. HODGSON, JR.
Colonel, Corps of Engineers
Acting Division Engineer

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HATCH POND DAM
CT 00603

HOUSATONIC RIVER BASIN
SHARON, CONNECTICUT

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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(1/2 PMF) was selected in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams. The test flood inflow of 2,125 cfs results in a routed outflow of 1,900 cfs that would overtop the dam by 0.9 feet.

The spillway capacity with the water level at the top of the dam is 780 cfs or 41 percent of the test flood routed outflow.

It is recommended that a qualified, registered engineer be retained to perform a detailed hydraulic and hydrologic analysis; to investigate the low level outlet or blowoff gate and the downstream seepage; and to oversee the removal of trees and stumps. In addition, the owner should clear brush from the dam, remove debris from the downstream channel, fill animal burrows, fill voids in the floor of the spillway discharge channel, institute a program of annual technical inspections, prepare an operations and maintenance manual, and put a formal warning system into effect.

The owner should implement the recommendations as described herein and in greater detail in Section 7 of this Report within one year after receipt of this Phase I Inspection Report.

Ronald G. Litke, P.E.
Project Engineer

Roald Haestad
President

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT 00603

NAME OF DAM: Hatch Pond Dam

TOWN: Sharon

COUNTY AND STATE: Litchfield County, Connecticut

STREAM: Mill Brook

DATE OF INSPECTION: July 29, 1980

BRIEF ASSESSMENT

The Hatch Pond Dam consists of an earth embankment with a maximum height of 31 feet, a top width of 12 feet, and an overall length of 340 feet, including a 41.5 foot long overflow spillway located at the right end of the dam. The outlet works located near the center of the dam consist of a 12-inch cast iron low level outlet or blowoff pipe through the embankment.

The dam impounds Hatch Pond which is used for recreational purposes.

Based on the visual inspection, the dam is judged to be in fair condition. Features that could affect the future integrity of the dam are downstream seepage, trees on the slopes and downstream toe area, the condition of the discharge channels, inadequate spillway capacity, and the downstream location of the low level outlet or blowoff gate.

The dam is classified as "Small" in size with a "High" hazard potential. A test flood equal to one-half the Probable Maximum Flood

This Phase I Inspection Report on Hatch Pond Dam (CT-00603) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the

condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety of the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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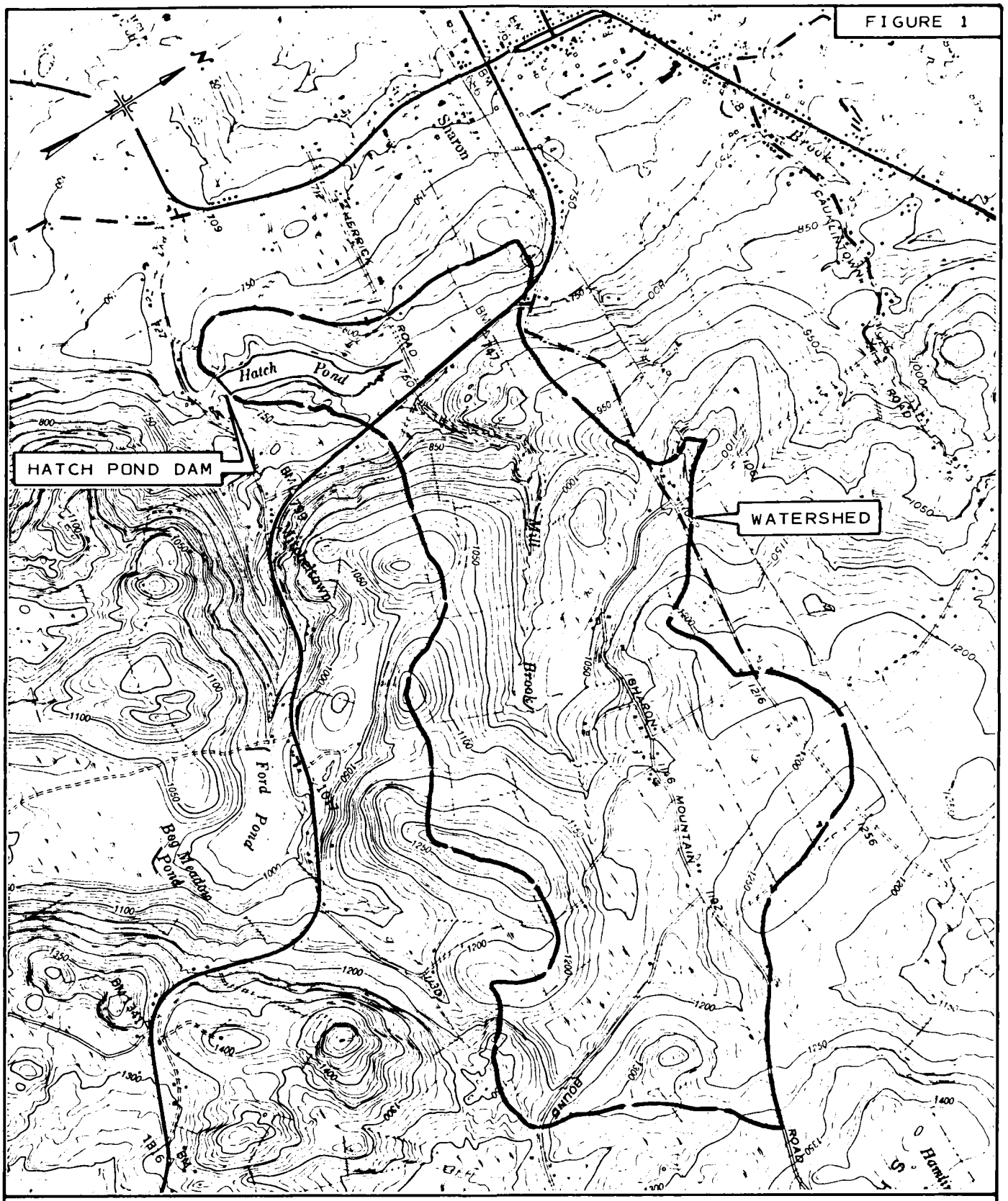
OVERVIEW PHOTO

U.S.ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM - CT 00603
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		MILL BROOK
		SHARON, CONNECTICUT — 19 APRIL '80

FIGURE 1



LOCATION PLAN

HATCH POND DAM
SHARON, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC. ELLSWORTH QUADRANGLE 1969

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

PROJECT INFORMATION
SECTION 1

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Roald Haestad, Inc., has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Roald Haestad, Inc., under a letter of April 14, 1980, from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0048 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.
2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.
3. To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

The dam is located on Mill Brook, a tributary to Webatuck Creek, approximately 3,000 feet east of Connecticut Route 41 in the west-central section of Sharon, Connecticut. The dam is shown on the Ellsworth Quadrangle Map having coordinates of latitude N41° 51.7' and longitude W73° 28.2'.

b. Description of Dam and Appurtenances

The Hatch Pond Dam consists of an earth embankment with a maximum height of 31 feet, a top width of 12 feet, and an overall length of 340 feet, including a 41.5 foot long overflow spillway located at the right end of the dam. The dam has a riprapped upstream slope of 3.3 horizontal to 1 vertical and a downstream slope of 2 horizontal to 1 vertical. The crest and downstream slope of the dam are covered with weeds, brush and small trees. The spillway consists of a concrete overflow section with granite cap stones and stone masonry training walls. The height from spillway crest to the top of the dam is 3.2 feet. The downstream spillway channel is mortared stone masonry about 15 feet wide and 260 feet long. A wooden footbridge over the spillway is supported by sections of railroad track and a center stone pier.

The outlet works located near the center of the dam consist of a 12-inch cast iron low level outlet or blowoff pipe through the embankment. The low level outlet or blowoff is controlled by a manually operated gate valve located in a gate chamber near the downstream toe of the embankment. A 4-inch cast iron pipe observed downstream of the gate chamber may be the outlet for a toe drain.

c. Size Classification - "Small"

According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, a dam is classified as "Small" in size if the height is between 25 feet and 40 feet or the dam impounds between 50 Acre-Feet and 1,000 Acre-Feet. The dam has a maximum height of 31 feet and a maximum storage capacity of 270 Acre-Feet. Therefore, the dam is classified as "Small" in size.

d. Hazard Classification - "High"

Based upon the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the hazard classification of Hatch Pond Dam is "High". A dam failure analysis indicates that 3 homes located approximately 3.4 miles downstream of the dam would be effected in the event of a dam breach, possibly resulting in the loss of more than a few lives.

Based upon the maximum spillway capacity of 780 cfs, the depth of flow in the area of the houses prior to dam breach would be about 5.5 feet and be contained within the channel. The depth of flow in this area due to the dam breach would be about 12.7 feet or 2 feet above sill elevation.

e. Ownership

Former Owner: Harold A. Hatch

Present Owner: The Estate of Harold A. Hatch
Howard R. Patch, Jr., Owner's Representative
Vice President
The Irving Trust Company
1 Wall Street
New York, New York
(212) 487-6476

f. Operator

George Hale
Sharon, Connecticut 06069
(203) 364-5788

g. Purpose of Dam

The dam impounds Hatch Pond which is used for recreational purposes.

h. Design and Construction History

There was no design or construction data available for review.

i. Normal Operational Procedures

The are no operational procedures for the dam.

1.3 Pertinent Data

a. Drainage Area

The drainage area consists of 2.0 square miles of "rolling" hills with wooded areas, farm land and swamps. Residential development is very limited within the watershed.

b. Discharge at Damsite

The discharge at the damsite is over a 41.5 foot long overflow spillway. The outlet works consist of a 12-inch cast iron low level outlet or blowoff.

1.	Outlet Works (conduits) Size:	12-inch pipe
	Invert Elevation:	704.6 at outlet
	Discharge Capacity:	14 cfs
2.	Maximum Known Flood at Damsite:	Unknown
3.	Ungated Spillway Capacity at Top of Dam:	780 cfs
	Elevation:	735.2
4.	Ungated Spillway Capacity at Test Flood Elevation:	1,140 cfs
	Elevation:	736.1
5.	Gated Spillway Capacity at Normal Pool Elevation:	N/A
	Elevation:	
6.	Gated Spillway Capacity at Test Flood Elevation:	N/A
	Elevation:	
7.	Total Spillway Capacity at Test Flood Elevation:	1,140 cfs
	Elevation:	736.1
8.	Total Project Discharge at Top of Dam:	780 cfs
	Elevation:	735.2
9.	Total Project Discharge at Test Flood Elevation:	1,900 cfs
	Elevation:	736.1

c. Elevation - Feet Above Mean Sea Level (NGVD)

1. Streambed at Toe of Dam:	704
2. Bottom of Cutoff:	N/A
3. Maximum Tailwater:	N/A
4. Recreation Pool:	732.0
5. Full Flood Control Pool:	N/A
6. Spillway Crest:	732.0
7. Design Surcharge - Original Design:	Unknown
8. Top of Dam:	735.2
9. Test Flood Surcharge:	736.1

d. Reservoir - Length in Feet

1. Normal Pool:	2,500 feet
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	2,500 feet
4. Top of Dam:	3,000 feet
5. Test Flood Pool:	3,000 feet

e. Storage - Acre-feet

1. Normal Pool:	190 Acre-Feet
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	190 Acre-Feet
4. Top of Dam:	270 Acre-Feet
5. Test Flood Pool:	300 Acre-Feet

f. Reservoir Surface - Acres

1. Normal Pool:	19 Acres
2. Flood-Control Pool:	N/A
3. Spillway Crest:	19 Acres
4. Test Flood Pool:	34 Acres
5. Top of Dam:	31 Acres

g. Dam

1.	Type:	Earth Embankment
2.	Length:	340 feet
3.	Height:	31 feet
4.	Top Width:	12 feet
5.	Side Slopes:	Downstream - 2 horizontal to 1 vertical Upstream - 3.3 horizontal to 1 vertical
6.	Zoning:	Unknown
7.	Impervious Core:	Unknown
8.	Cutoff:	Unknown
9.	Grout Curtain:	N/A
10.	Other:	

h. Diversion and Regulating Tunnel N/A

i. Spillway

1. Type:	Concrete and stone masonry overflow spillway
2. Length of Weir:	41.5 feet
3. Crest Elevation with Flash Boards: without Flash Boards:	 N/A 732.0
4. Gates:	N/A
5. Upstream Channel:	N/A
6. Downstream Channel:	Mortared stone masonry
7. General:	

j. Regulating Outlets

1. Invert: at outlet:	704.6
2. Size:	12-inch
3. Description:	Cast iron pipe through the earth embankment
4. Control Mechanism:	Manually operated gate valve in downstream valve chamber.
5. Other:	Discharge capacity - 14 cfs

ENGINEERING DATA

SECTION 2

2.1 Design Data

There was no design data available for review.

2.2 Construction Data

There was no construction data available for review.

2.3 Operation Data

There was no operation data available for review.

2.4 Evaluation of Data

a. Availability

There was no data available from the owner of the dam or the State of Connecticut Department of Environmental Protection.

b. Adequacy

As there was no available information on the dam, the assessment of the condition of the dam was based upon the visual inspection, past performance history, and the hydrologic and hydraulic calculations made for this Report.

VISUAL INSPECTION

SECTION 3

3.1 Findings

a. General

The visual inspection of the dam was conducted on July 29, 1980. At the time of inspection the water level was approximately 0.1 feet below spillway level.

Hatch Pond Dam consists of an earth embankment with the outlet works located near the center of the dam and an overflow spillway at the right end of the dam, Photo 1.

The general condition of the dam at the time of inspection was fair.

b. Dam

The upstream slope of the dam is protected by riprap from below the water level to about 1 foot below the crest. The riprap appears to be in good condition but is heavily overgrown with weeds and brush, Photo 2. Several trees up to 3 inches in diameter are growing on the upstream slope near the center and right end of the dam, Photo 1.

The crest of the dam is about 12 feet wide and is covered with brush and weeds, Photo 3. A footpath along the center of the crest shows no evidence of regular trespass. Several trees up to 3 inches in diameter are growing on the crest.

The downstream slope of the dam is overgrown with heavy brush and trees up to 6 inches in diameter, Photo 4. Thick undergrowth and ground cover make thorough inspection of the downstream face impossible. An animal burrow was observed at the contact

between the downstream slope and the left abutment. Stones have been placed in this area, possibly to prevent erosion.

Seepage and wetness were observed at the downstream toe near the left abutment, Photo 5, and in the area of the outlet works and the spillway discharge channel. There was no visible movement of water or evidence of flow channels from the seepage areas. The entire area downstream of the toe appeared wet and marshy.

c. Appurtenant Structures

The appurtenant structures consist of an overflow spillway, a service bridge over the spillway and the outlet works.

Spillway

The spillway located at the right end of the dam consists of a concrete overflow section with a mortared cut stone cap, Photo 6. The spillway appears to be in good condition. There is a slight amount of leakage under the cap stones. At the left end of the spillway there is an inclined flume approximately 2 feet wide and slightly lower in elevation than the remaining spillway crest, Photo 6. The upstream stone masonry training walls are overgrown with brush and vines and appear to be in good condition.

The spillway discharge channel is approximately 260 feet long and discharges into a natural streambed. The channel is trapeziodal shaped with a mortared stone floor and side slopes. Some voids were observed in the stone work, Photo 7. The sides of the channel are heavily overgrown with brush and several trees up to 12 inches in diameter are overhanging the channel. Approximately 100 feet downstream of the spillway there is what appears to be

a wood sheet pile cutoff below the bottom of the channel, Photo 8. The end of the channel has been undermined and is badly broken, Photo 9.

Service Bridge

The service bridge over the spillway consists of a wooden footbridge supported by steel rails and a center stone pier, Photo 6. The bridge appears to be in good condition with the exception of a broken railing and possible tilting of the center pier.

Outlet Works

The outlet works located near the center of the dam consist of a 12-inch cast iron low level outlet or blowoff pipe through the dam controlled by a downstream manually operated gate valve. The gate valve is contained in a concrete valve chamber near the toe of the dam. The chamber and gate valve appeared to be in good condition. The gate valve was reported to be operable. The outlet pipe discharges into a natural channel at the downstream toe of the dam.

Just above the end of the outlet pipe there is a 4-inch diameter pipe inclined upward at about 5 horizontal to 1 vertical, Photo 10. The purpose of the pipe is unknown, but it may be the discharge for a toe drain. There was a slight discharge of water from the pipe.

d. Reservoir Area

Along the right side of the reservoir the slope is paved with stone masonry and a drainage ditch diverts water from an adjacent hillside to the discharge channel below the dam.

e. Downstream Channel

The downstream channel for the outlet works is a natural channel heavily overgrown with brush and weeds.

The spillway discharge channel was discussed under Section 3.1.c, Appurtenant Structures. Beyond the end of the channel a pool of water is impounded by a debris dam in the natural streambed.

3.2 Evaluation

Based on the visual observations, the dam appears to be in fair condition. The following features could affect the future integrity of the dam:

1. The location of the low level outlet or blowoff valve at the downstream toe permits full water pressure to exist in the outlet pipe through the dam. In the event of a leak in the outlet pipe, seepage and high pore pressures near the downstream toe or base of the dam could cause sliding failure or piping failure of the embankment.

2. Seepage at the downstream toe could cause internal erosion, leading to piping failure of the foundation or embankment.

3. Trees on the crest and slopes could overturn, leaving open root holes which may act as seepage paths, leading to internal erosion and piping failure of the foundation or embankment.

4. Blockage of the natural streambed below the end of the spillway discharge channel could cause water to pond in the streambed, causing flooding and erosion in the toe area of the dam and at the lower end of the spillway discharge channel.

5. Voids in the mortar and stonework could cause undermining and breakup of the spillway discharge channel.

6. Animal burrows may act as seepage paths, leading to internal erosion and piping failure of the embankment.

OPERATIONAL AND MAINTENANCE PROCEDURES

SECTION 4

4.1 Operational Procedures

a. General

There are no operational procedures for the dam.

b. Description of Any Warning System In Effect

There is no warning system in effect.

4.2 Maintenance Procedures

a. General

There are no maintenance procedures for the dam.

b. Operating Facilities

There are no maintenance procedures for the operating facilities.

4.3 Evaluation

The overall condition of the dam is an indication that maintenance of the dam has not taken place in recent years.

An operations and maintenance manual should be prepared for the dam and operating facilities, and a formal warning system put into effect. The dam should also be inspected annually by a qualified, registered engineer.

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

SECTION 5

5.1 General

The spillway for Hatch Pond Dam is a 41.5 foot long concrete overflow section with granite cap stones, located at the right end of the dam. The spillway crest is 3.2 feet below the top of the dam. The spillway discharges to a stone masonry channel which runs for approximately 260 feet at an average slope of 11 percent before reaching the natural stream channel.

The dam has a tributary watershed of 2.0 square miles. The terrain is "rolling" hills with wooded areas, farm land and swamp areas. There is very limited residential development within the watershed. Elevations range from about 1,300 feet at the upper end of the watershed to 732 feet at the dam.

Piping at the dam consists of a 12-inch low level outlet or blowoff controlled by a downstream gate valve located in a concrete valve chamber. The low level outlet or blowoff has a discharge capacity of 14 cfs.

5.2 Design Data

No design data on the dam or spillway was available.

5.3 Experience Data

No records of past flood experience were available.

5.4 Test Flood Analysis

Based on the dam failure analysis, the dam is classified as "High" hazard potential. The size of the dam is "Small", based on a height of 31 feet and storage capacity of 270 Acre-Feet. According to the Recommended Guidelines for Safety Inspection of Dams, by the

Corps of Engineers, the test flood should be in the range of one-half the Probable Maximum Flood (1/2 PMF) to the Probable Maximum Flood (PMF), depending on the involved risk. A test flood equal to 1/2 PMF was selected because of the sparse development downstream and the small storage capacity of the impoundment. The Test Flood was calculated using 2,125 cubic feet per second per square mile (csm) peak inflow for the PMF, from the minimum 2 square mile drainage area shown on the guide curves supplied by the Corps of Engineers, and the 2.0 square mile watershed of Hatch Pond Dam. The peak 1/2 PMF inflow was calculated to be 2,125 cfs and the routed outflow 1,900 cfs. The flood routing through the dam was done in accordance with "Estimating the Effects of Surcharge Storage on Maximum Probable Discharges" provided by the Corps of Engineers.

The spillway capacity was calculated to be 780 cfs or 41 percent of the test flood routed outflow. The test flood would overtop the dam by 0.9 feet.

The spillway capacity of this dam appears to be inadequate and overtopping could occur in the future.

5.5 Dam Failure Analysis

A dam failure analysis was made using the "Rule of Thumb" guidance provided by the Corps of Engineers. Failure was assumed with the water level at the top of the dam.

The dam breach would release about 22,600 cfs into the stream below the dam. The flood wave would travel for approximately 3.4 miles in a channel and adjoining wooded areas or pasture land before reaching inhabited structures. At the New York State line, the flood waters would overtop Route 41 and flood 3 homes to approximately

2 feet above sill level. Beyond Route 41 the flood would continue downstream and join Webatuck Creek without additional damage or loss of life expected.

Based upon the maximum spillway capacity of 780 cfs, the depth of flow in the area of the houses prior to dam breach would be about 5.5 feet and would be contained within the channel. The depth of flow in this area due to the dam breach would be about 12.7 feet.

The dam is classified as "High" hazard potential. A dam failure could result in the loss of more than a few lives.

EVALUATION OF STRUCTURAL STABILITY

SECTION 6

6.1 Visual Observations

The visual observations did not disclose any evidence of present or past structural instability. The future stability of the dam could be affected by:

1. Location of low level outlet or blowoff control valve at downstream toe;
2. Seepage at toe;
3. Trees on crest and slopes;
4. Blockage of natural streambed at base of spillway discharge channel;
5. Voids in bottom of spillway discharge channel;
6. Discharge of low level outlet or blowoff into unlined channel at toe; and
7. Animal burrows on downstream slope.

6.2 Design and Construction Data

No design or construction drawings or records of the dam were available for review.

6.3 Post-Construction Changes

No known post-construction changes have been made that would jeopardize the integrity of the dam.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with the recommended Phase I guidelines does not warrant seismic stability analysis.

ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES
SECTION 7

7.1 Assessment

a. Condition

Based on the visual inspection, the dam appears to be in fair condition. The following features could affect the future integrity of the dam:

1. Location of the low level outlet or blowoff valve at the downstream toe.
2. Seepage at the toe of the downstream slope.
3. Trees on the upstream and downstream embankment slopes and in the immediate downstream toe area.
4. Blockage of the natural streambed at the base of the spillway discharge channel.
5. Voids in the masonry floor of the spillway discharge channel and undermining of the lower end of the channel.
6. Animal burrows at the contact of the downstream slope with the left abutment.

An evaluation of the hydraulic and hydrologic features of the dam determined that the spillway is capable of passing 41 percent of the test flood routed outflow (1/2 PMF).

b. Adequacy of Information

As no design or construction data was available for review, the assesment of the condition of the dam was based on the visual inspection, past performance history, and hydraulic and hydrologic calculations made for this Report.

c. Urgency

The recommendations described in Sections 7.2 and 7.3 should be carried out by the owner within one year after receipt of this Report.

7.2 Recommendations

The following items should be carried out under the direction of a qualified, registered engineer:

1. Investigate the significance of the location of the low level outlet or blowoff valve at the downstream toe and recommend measures to relieve full reservoir water pressure in the outlet pipe under the dam.

2. Investigate the significance of the seepage at the downstream toe and recommend measures to monitor the seepage and/or to prevent piping of the foundation and embankment soils.

3. Remove trees from the crest, upstream and downstream slopes and to within 20 feet of the toe, and carefully backfill the root zones with selected soils. Following brush and tree removal, the downstream slope should be inspected.

4. Investigate requirements for channel and slope protection at the low level outlet or blowoff and recommend measures for preventing scour and undermining of the outlet pipe and embankment.

5. Investigate and recommend procedures to prevent further undermining of the lower end of the spillway discharge channel.

6. Perform a detailed hydraulic and hydrologic analysis in order to determine the need for and means to provide additional project discharge capacity.

The owner should implement all recommendations made by the engineer based on the above investigations.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. Clear brush and vines from the upstream slope, crest, downstream slope, area downstream to within twenty feet of the toe, and along the spillway discharge channel; and establish a regular mowing program.

2. Remove debris from the streambed at the base of the downstream spillway discharge channel.

3. Backfill animal burrows on the downstream slope with appropriate soils.

4. Fill all voids in the masonry floor of the downstream spillway discharge channel with stone and mortar.

5. Institute a program of annual technical inspection by qualified, registered engineers.

6. Prepare an operations and maintenance manual for the dam and operating facilities.

7. Put into effect a formal warning system to include monitoring of the dam during extremely heavy rains and procedures for notifying downstream authorities in the event of an emergency.

8. Repair footbridge railing and center pier.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

VISUAL CHECK LIST WITH COMMENTS

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT: Hatch Pond Dam

DATE: 7/29/80 TIME: 9:30 a.m. WEATHER: Cloudy with Rain

W.S. ELEVATION: 731.9 U.S. N/A DN.S

(0.1' below spillway)

	PARTY	DISCIPLINE
1.	Ronald G. Litke, P.E. - Roald Haestad, Inc.	Civil/Structural
2.	Donald L. Smith, P.E. - Roald Haestad, Inc.	Civil/Hydrology
3.	Gonzalo Castro, PhD, P.E. - Geotechnical Engineers, Inc.	Geotechnical
4.	Frank Leathers, P.E. - Geotechnical Engineers, Inc.	Geotechnical
5.		
6.		

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Embankment	RGL,DLS,GC,FL	Overgrown. Some downstream seepage.
2.	Outlet Works - Intake Channel & Structure	RGL,DLS,GC,FL	Not visible
3.	Outlet Works - Control Tower	RGL,DLS	Concrete valve chamber near downstream toe
4.	Outlet Works - Transition & Conduit	RGL,DLS	12-inch cast iron pipe
5.	Outlet Works - Discharge Structure & Channel	RGL,DLS,GC,FL	No structure. Channel is natural streambed.
6.	Outlet Works - Spill. Wier, Appr. & Discharge	RGL,DLS,GC,FL	Good condition. Some seepage under cut stone cap.
7.	Outlet Works - Service Bridge	RGL,DLS	Good condition. Center pier tilting.
8.			
9.			
10.			
11.			
12.			

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Dam Embankment NAME: RGL,DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: GC,FL

AREA ELEVATION	CONDITIONS
DAM EMBANKMENT	
CREST ELEVATION	735
CURRENT POOL ELEVATION	731.9 (0.1' below spillway)
MAXIMUM IMPOUNDMENT TO DATE	Unknown
SURFACE CRACKS	None observed
PAVEMENT CONDITION	N/A
MOVEMENT OR SETTLEMENT OF CREST	Too overgrown to judge
LATERAL MOVEMENT	Too overgrown to judge
VERTICAL ALIGNMENT	Too overgrown to judge
HORIZONTAL ALIGNMENT	Too overgrown to judge
CONDITION AT ABUTMENT AND AT CONCRETE STRUCTURES	Good
INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES	None observed
TRESPASSING ON SLOPES	None observed
VEGETATION ON SLOPES	Trees and heavy brush on crest and slopes
SLOUGHING OR EROSION OF SLOPES OR ABUTMENTS	None observed
ROCK SLOPE PROTECTION - RIPRAP FAILURES	Riprap in good condition but overgrown with brush and small trees
UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES	None observed
EMBANKMENT OR DOWNSTREAM SEEPAGE	Wetness and seepage at several locations along the downstream toe
PIPING OR BOILS	None observed
FOUNDATION DRAINAGE FEATURES	None observed
TOE DRAINS	4-inch pipe exiting above low level outlet, possibly from toe drain
INSTRUMENTATION SYSTEM	None observed

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Outlet Works - Intake Channel and Intake Structure NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: GC, FL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
A. APPROACH CHANNEL:	Not visible - underwater
SLOPE CONDITIONS	
BOTTOM CONDITIONS	
ROCK SLIDES OR FALLS	
LOG BOOM	
DEBRIS	
CONDITION OF CONCRETE LINING	
DRAINS OR WEEP HOLES	
B. INTAKE STRUCTURE:	
CONDITION OF CONCRETE	
STOP LOGS AND SLOTS	

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Outlet Works - Control Tower NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	
A. CONCRETE AND STRUCTURAL:	
GENERAL CONDITION	Good
CONDITION OF JOINTS	No joints observed
SPALLING	None observed
VISIBLE REINFORCING	None observed
RUSTING OR STAINING OF CONCRETE	None observed
ANY SEEPAGE OR EFFLORESCENCE	None observed
JOINT ALIGNMENT	N/A
UNUSUAL SEEPAGE OR LEAKS IN GATE CHAMBER	Chamber appeared dry
CRACKS	None observed
RUSTING OR CORROSION OF STEEL	None noted
B. MECHANICAL AND ELECTRICAL:	
AIR VENTS	N/A
FLOAT WELLS	N/A
CRANE HOIST	N/A
ELEVATOR	N/A
HYDRAULIC SYSTEM	N/A
SERVICE GATES	Appeared to be in good condition
EMERGENCY GATES	N/A
LIGHTNING PROTECTION SYSTEM	N/A
EMERGENCY POWER SYSTEM	N/A
WIRING AND LIGHTING SYSTEM IN GATE CHAMBER	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Outlet Works - Transition & Conduit NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	
GENERAL CONDITION OF CONCRETE	Conduit consists of 12-inch cast iron pipe
RUST OR STAINING ON CONCRETE	N/A
SPALLING	N/A
EROSION OR CAVITATION	N/A
CRACKING	N/A
ALIGNMENT OF MONOLITHS	N/A
ALIGNMENT OF JOINTS	N/A
NUMBERING OF MONOLITHS	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Outlet Works - Outlet Structure and Channel NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: GC, FL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
GENERAL CONDITION OF CONCRETE	No outlet structure
RUST OR STAINING	
SPALLING	
EROSION OR CAVITATION	
VISIBLE REINFORCING	
ANY SEEPAGE OR EFFLORESCENCE	
CONDITION AT JOINTS	
DRAIN HOLES	N/A
CHANNEL	Natural Streambed
LOOSE ROCK OR TREES OVERHANGING CHANNEL	Large trees and heavy brush over and around channel
CONDITION OF DISCHARGE CHANNEL	Many branches and leaves in channel, but channel was not blocked

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

PROJECT FEATURE: Outlet Works - Spillway, Weir, App., and Discharge Channel NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: GC, FL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
A. APPROACH CHANNEL:	
GENERAL CONDITION	Good
LOOSE ROCK OVERHANGING CHANNEL	None
TREES OVERHANGING CHANNEL	None
FLOOR OF APPROACH CHANNEL	Not visible below water
B. WEIR AND TRAINING WALLS:	
GENERAL CONDITION OF CONCRETE	Good
RUST OR STAINING	Some staining below cut stone crest
SPALLING	None observed
ANY VISIBLE REINFORCING	None observed
ANY SEEPAGE OR EFFLORESCENCE	Water seeping under cut stone crest
DRAIN HOLES	None observed - drainage through cracks in masonry
C. DISCHARGE CHANNEL:	
GENERAL CONDITION	Good, but natural streambed below end of discharge channel is blocked by debris
LOOSE ROCK OVERHANGING CHANNEL	None
TREES OVERHANGING CHANNEL	Several large trees over channel & frequent brush encroaching on sides of channel
FLOOR OF CHANNEL	Mortared stone masonry with some voids and missing stones, undermining at end or channel
OTHER OBSTRUCTIONS	Debris below end on discharge channel
OTHER COMMENTS	Wood sheet pile cutoff observed across portion of discharge channel

PERIODIC INSPECTION CHECK LIST

PROJECT: Hatch Pond Dam DATE: 7/29/80

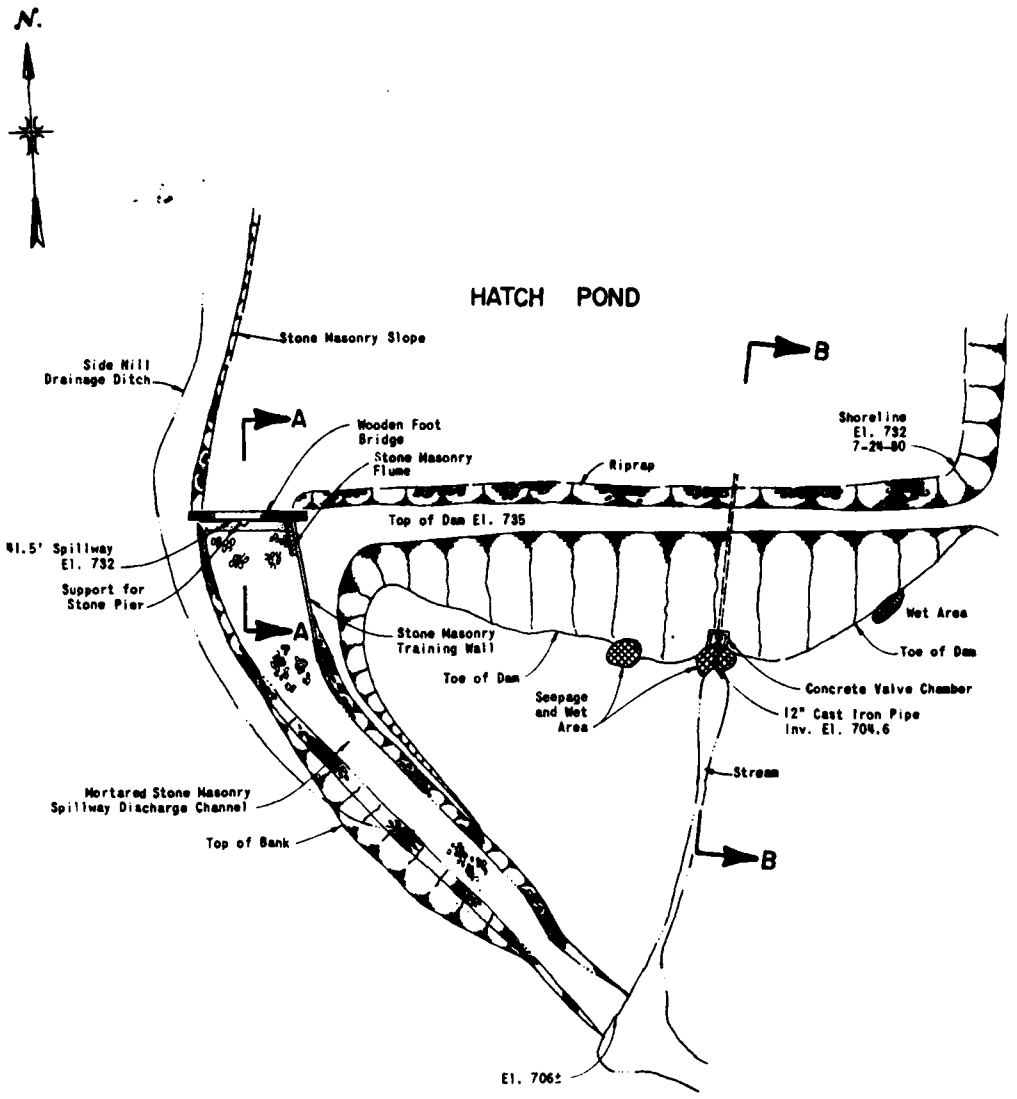
PROJECT FEATURE: Outlet Works - Service Bridge NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

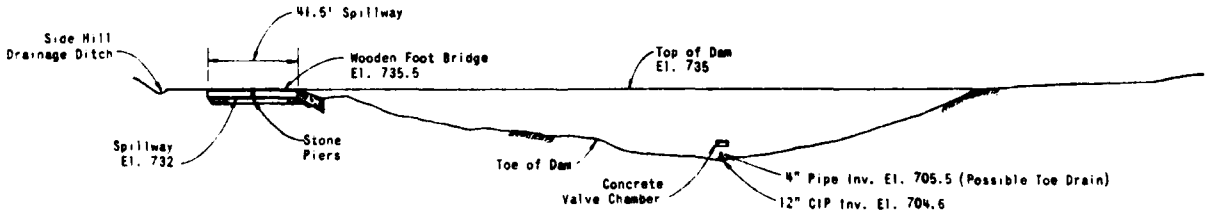
AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
A. SUPER STRUCTURE:	
BEARINGS	Steel rails bear on spillway training walls
ANCHOR BOLTS	N/A
BRIDGE SEAT	N/A
LONGITUDINAL MEMBERS	Steel Rails
UNDER SIDE OF DECK	Good - Wooden Planks
SECONDARY BRACING	N/A
DECK	Wooden Planks
DRAINAGE SYSTEM	N/A
RAILINGS	Portion missing
EXPANSION JOINTS	N/A
PAINT	No paint
B. ABUTMENT AND PIERS:	
GENERAL CONDITION OF CONCRETE	Center stone pier tilting
ALIGNMENT OF ABUTMENT	Good
APPROACH TO BRIDGE	Good
CONDITION OF SEAT AND BACKWALL	N/A

APPENDIX B

ENGINEERING DATA

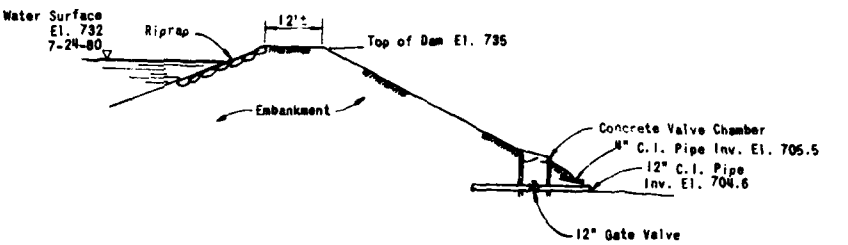


PLAN
Scale 1"= 80'

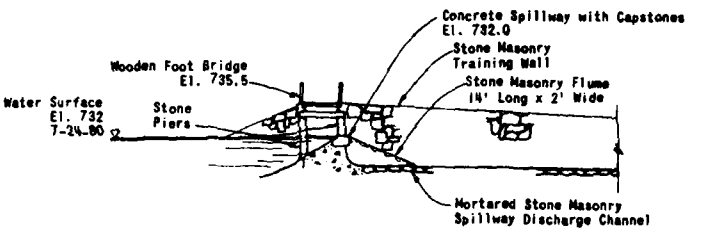


ELEVATION
Scale 1"= 80'

FIGURE 2



SECTION B-B
Scale 1"=40'



SECTION A-A
Scale 1"=20'

ROALD HAESTAD, INC. *CONSULTING ENGINEERS* WATERBURY, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND *CORPS OF ENGINEERS* WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HATCH POND DAM

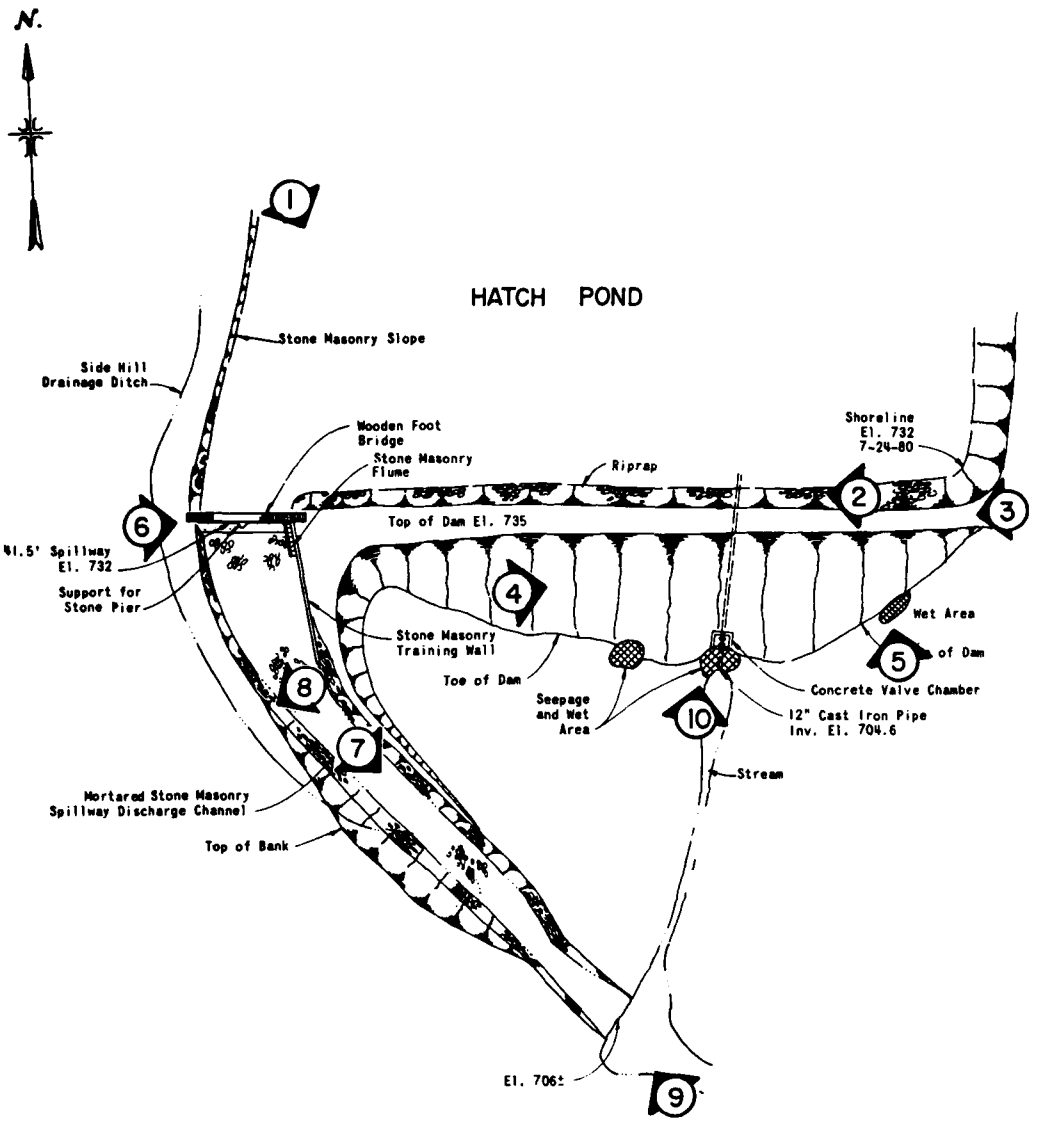
DRAWN	CHECKED	APPROVED	SCALES AS NOTED	
JRS	RGL	RH	DATE SEPT 1980	PAGE B-1

2

APPENDIX C

PHOTOGRAPHS

FIGURE 3



PLAN
Scale 1" = 80'

ROALD HAESTAD, INC. *CONSULTING ENGINEERS* WATERBURY, CONNECTICUT	U.S ARMY ENGINEER DIV. NEW ENGLAND *CORPS OF ENGINEERS* WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

PHOTO LOCATION PLAN

HATCH POND DAM

SHARON, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALES AS NOTED
JRS	RGL	RH	DATE SEPT 1980 PAGE C-1

Denotes photo number and direction in which photo was taken.

PHOTO NO. 1

VIEW OF DAM FROM RIGHT SIDE OF POND.
NOTE SERVICE BRIDGE OVER SPILLWAY AT
RIGHT AND VEGETATION ON UPSTREAM SLOPE AND CREST.

PHOTO NO. 2

RIPRAP SLOPE PROTECTION
ON UPSTREAM SLOPE OF DAM

U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM MILL BROOK SHARON, CONNECTICUT CT 00603 29 JULY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 3

CREST OF DAM VIEWED FROM
LEFT ABUTMENT. NOTE VEGETATION.

PHOTO NO. 4

DOWNSTREAM SLOPE VIEWED FROM
RIGHT SIDE OF DAM.

U S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM MILL BROOK SHARON, CONNECTICUT CT 00603 29 JULY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 5

SEEPAGE AT DOWNSTREAM TOE NEAR LEFT ABUTMENT.

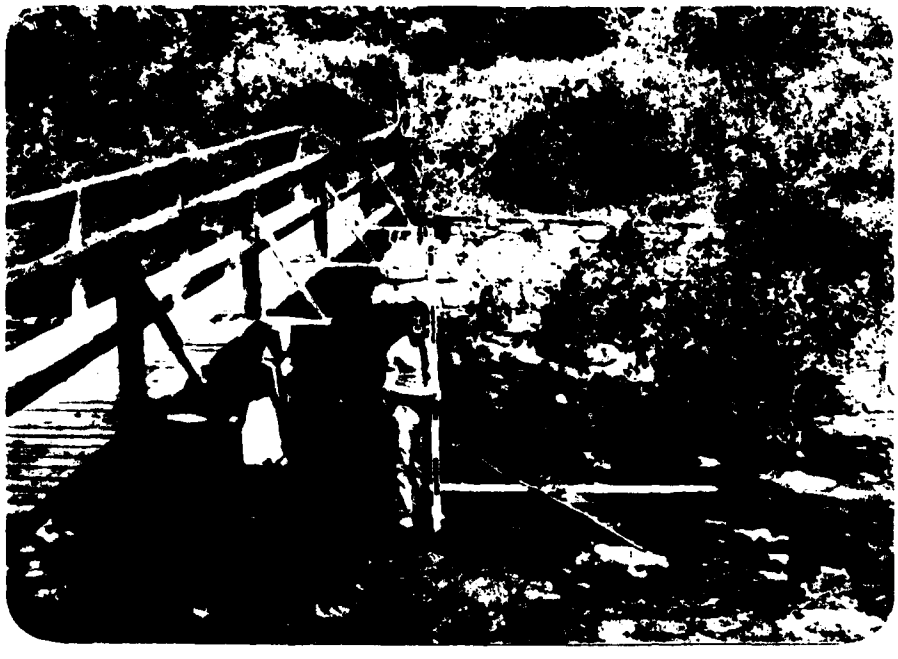


PHOTO NO. 6

SPILLWAY FROM RIGHT ABUTMENT. NOTE FLUME AT LEFT END OF SPILLWAY AND SERVICE BRIDGE.

U.S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM MILL BROOK SHARON, CONNECTICUT CT 00603 29 JULY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 7

VOIDS IN BOTTOM OF SPILLWAY
DISCHARGE CHANNEL.

PHOTO NO. 8

WOOD SHEETING IN SPILLWAY
DISCHARGE CHANNEL.

US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM MILL BROOK SHARON, CONNECTICUT CT 00603 29 JULY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 9

UNDERMINING AND DETERIORATION AT END OF SPILLWAY DISCHARGE CHANNEL.

PHOTO NO. 10

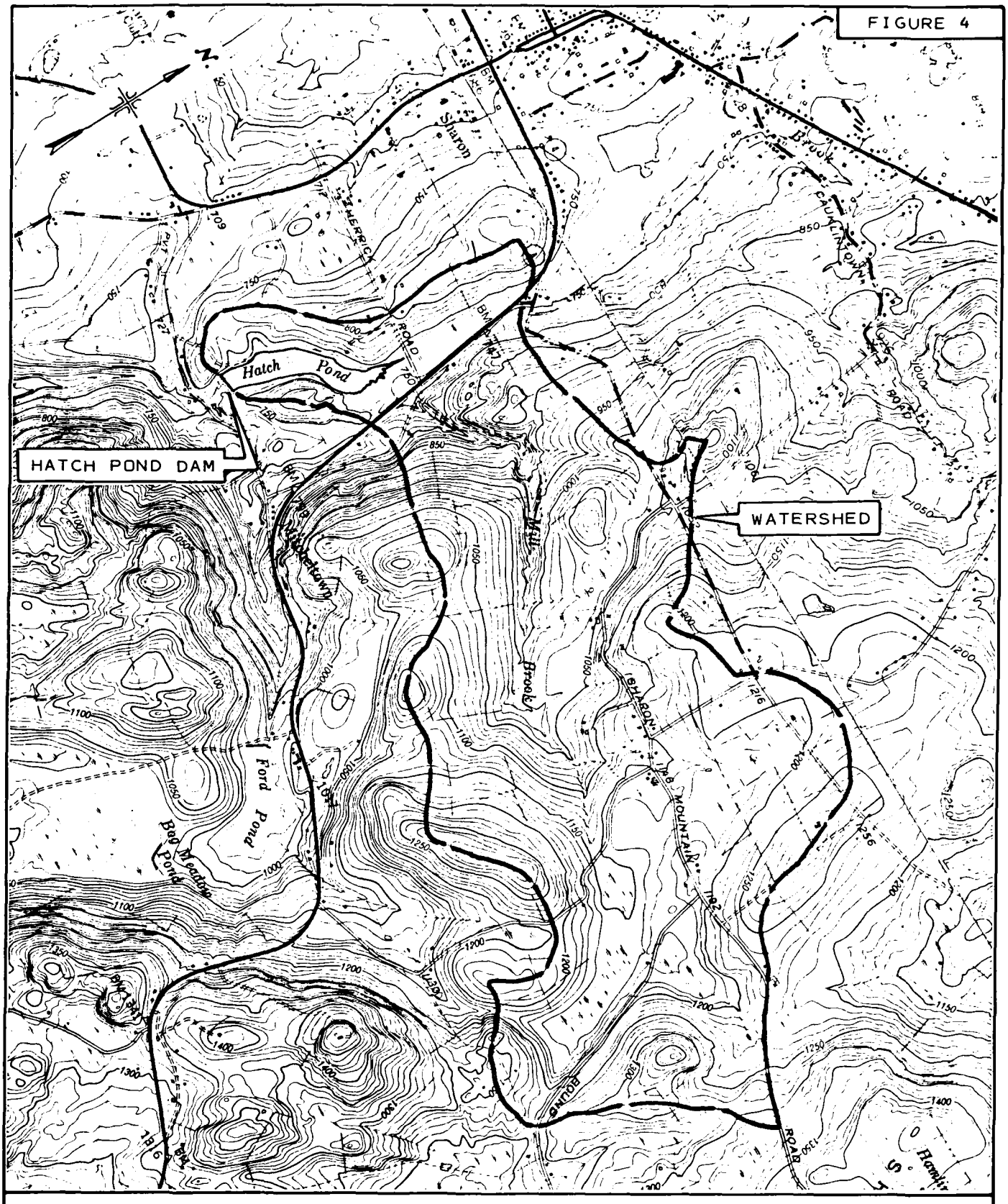
OUTLET WORKS GATE CHAMBER. NOTE 12-INCH LOW LEVEL OUTLET OR BLOWOFF PIPE (YELLOW RULE) AND POSSIBLE 4-INCH TOE DRAIN.

U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	HATCH POND DAM MILL BROOK SHARON, CONNECTICUT CT 00603 29 JULY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

FIGURE 4



WATERSHED MAP

HATCH POND DAM
SHARON, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC.

ELLSWORTH QUADRANGLE 1969

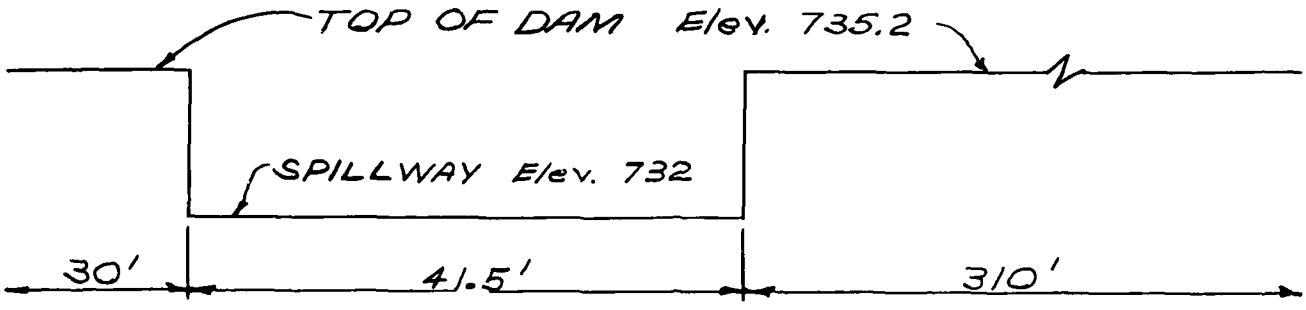
BY SAL DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 1 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 8/21/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - Project Discharge Capacity

Spillway and Dam Profile:



Discharge Coefficients: 1) Spillway C = 3.30
2) Dam C = 2.65

Spillway Capacity @ top of dam.

$Q = CLH^{3/2}$

$Q = 3.3(41.5)(3.2)^{1.5}$

$Q = 783.9$ use 784 cfs

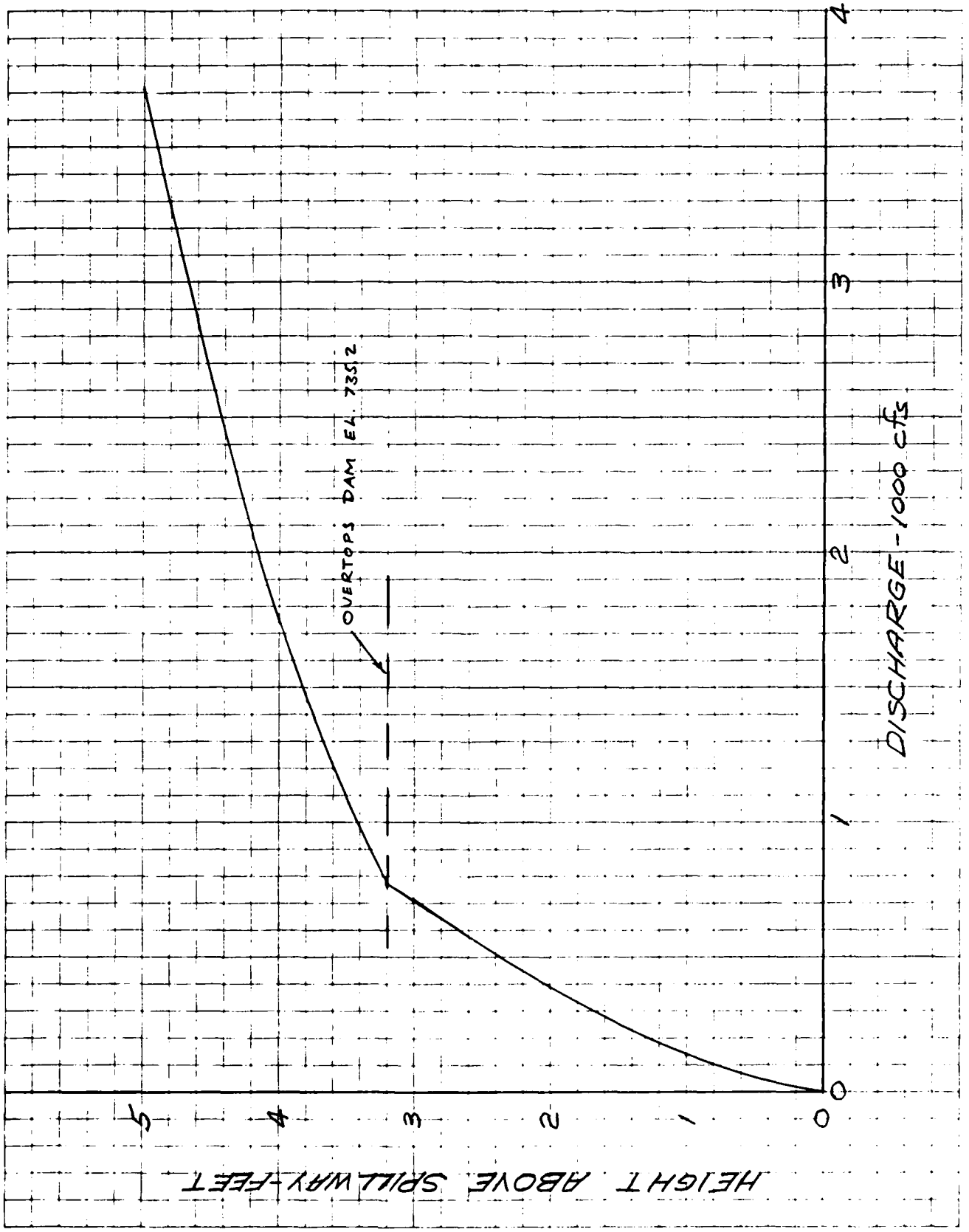
Height Above Spillway (ft)	Spillway Discharge Capacity (cfs)	Dam Discharge Capacity (cfs)	Total Discharge Capacity (cfs)
0	0	0	0
1	137	0	137
2	387	0	387
3	712	0	712
4	1,096	645	1,741
4.5	1,307	1,335	2,642
5	1,531	2,176	3,707

BY SAL DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 2 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 8/22/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - Project Discharge Capacity Curve



BY SAL DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 3 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 8/21/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - Surcharge Storage Capacity

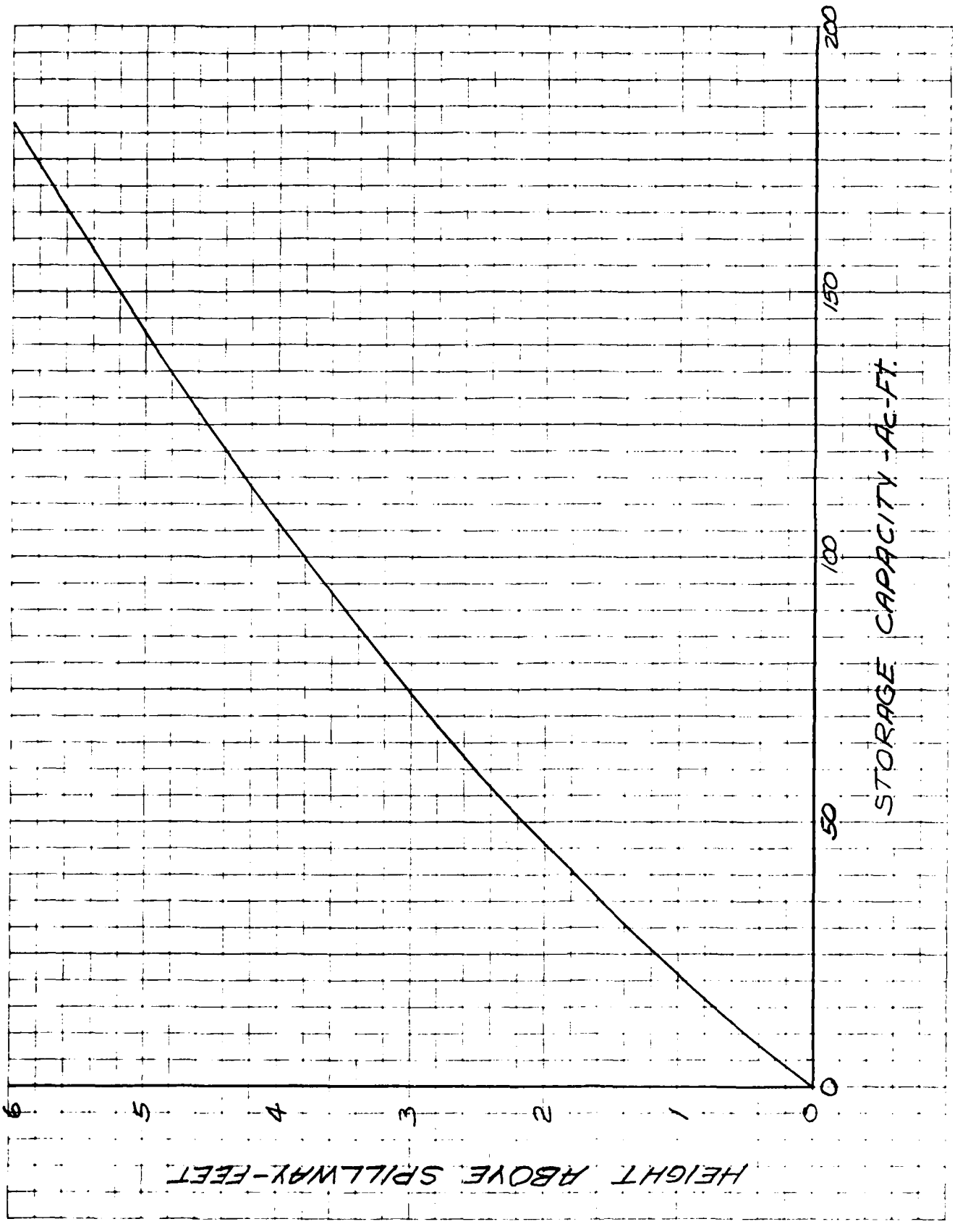
Height Above Spillway (ft)	Surface Area (Acres)	Average Surface Area (Acres)	Storage Volume (Ac-Ft)
0	19.0		0
		20.9	
1	22.8		20.9
		24.65	
2	26.5		45.6
		28.4	
3	30.3		74.0
		32.15	
4	34.0		106.1
		35.9	
5	37.8		142.0
		39.65	
6	41.5		181.7
		43.4	
7	45.3		225.1
		47.15	
8	49.0		272.2

BY SAL DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 4 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 8/22/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - Surcharge Storage Capacity Curve



Test Flood = 1/2 PMF

Drainage Area = 1,274 acres = 1.99 use 2.0 sq. mi.

From Corps of Eng chart for "Rolling" Terrain

MPF = 2,125 cfs/sq. mi.

PMF = 2,125 cfs/sq mi × 2.0 sq mi = 4,250 cfs

1/2 PMF = 1/2 (4,250 cfs) = 2,125 cfs

Q_{P1} = 2,125 cfs

H_1 = 4.2 ft above spillway, from Discharge Capacity Curve

$STOR_1$ = 115 ac-ft, From Storage Capacity Curve

= 1.1" runoff from 2.0 sq. mi.

Maximum Probable Flood Runoff in New England equals approx. 19 in. Therefore 1/2 PMF equals approx. 1/2(19") = 9.5"

$Q_{P2} = Q_{P1}(1 - STOR_1/9.5) = 2,125 cfs (1 - 1.1/9.5) = 1,879$ cfs

H_2 = 4.1 ft $STOR_2$ = 110 ac-ft

$STOR_{AVE} = (STOR_1 + STOR_2)/2 = (115+110)/2 = 107.5$ ac-ft
= 1.0" runoff

$Q_{P3} = Q_{P1}(1 - STOR_{AVE}/9.5) = 2,125 cfs (1 - 1/9.5) = 1,901$ cfs
Use 1,900 cfs

H_3 = 4.1 ft

Spillway Capacity @ top of dam:

$Q = CLH^{3/2} = 3.3(41.5')(3.2)^{1.5}$
$Q = 783.9$ use 784 cfs

% of 1/2 PMF = (784/1,900) × 100 = 41% of 1/2 PMF

S = Storage at Time of failure with water level at top of dam

S = Storage at spillway level + Freeboard storage

S = (Surface Area x Estimated Average depth) + (From surcharge storage capacity curve)

S = (19 acres x 10 feet) + (80 ac-ft)

S = 190 ac-ft + 80 ac-ft = 270 ac-ft

Q_{P1} = Peak Failure Outflow = $8/27\ W_b \sqrt{g}\ Y_o^{3/2}$

W_b = Breach Width - 40% of dam length across river at mid height = 0.4(195) = 78'

Y_o = Total height from river bed to pool level at time of failure = 31 ft

$Q_{P1} = 8/27\ (78)(\sqrt{32.2})(31)^{3/2}$

Q_{P1} = 22,635.6 use 22,635 cfs

SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 1

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	16	8	.50	.0210	1.35	11
2.0	32	32	.99	.0210	2.14	69
3.0	48	72	1.49	.0210	2.81	202
4.0	64	128	1.98	.0210	3.40	435
5.0	81	200	2.48	.0210	3.95	789
6.0	97	288	2.98	.0210	4.46	1283
7.0	113	392	3.47	.0210	4.94	1936
8.0	129	512	3.97	.0210	5.40	2764
9.0	145	648	4.47	.0210	5.84	3784
10.0	161	800	4.96	.0210	6.26	5011
11.0	170	964	5.69	.0210	6.86	6614
12.0	178	1136	6.39	.0210	7.42	8424
13.0	186	1316	7.07	.0210	7.94	10443
14.0	194	1504	7.74	.0210	8.43	12674
15.0	203	1700	8.39	.0210	8.89	15119
16.0	211	1904	9.03	.0210	9.34	17782
17.0	219	2116	9.66	.0210	9.77	20666
18.0	227	2336	10.28	.0210	10.18	23776
19.0	236	2564	10.88	.0210	10.58	27115
20.0	244	2800	11.48	.0210	10.96	30688

MANNING COEFFICIENT=N=.1000
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 2400 FT.

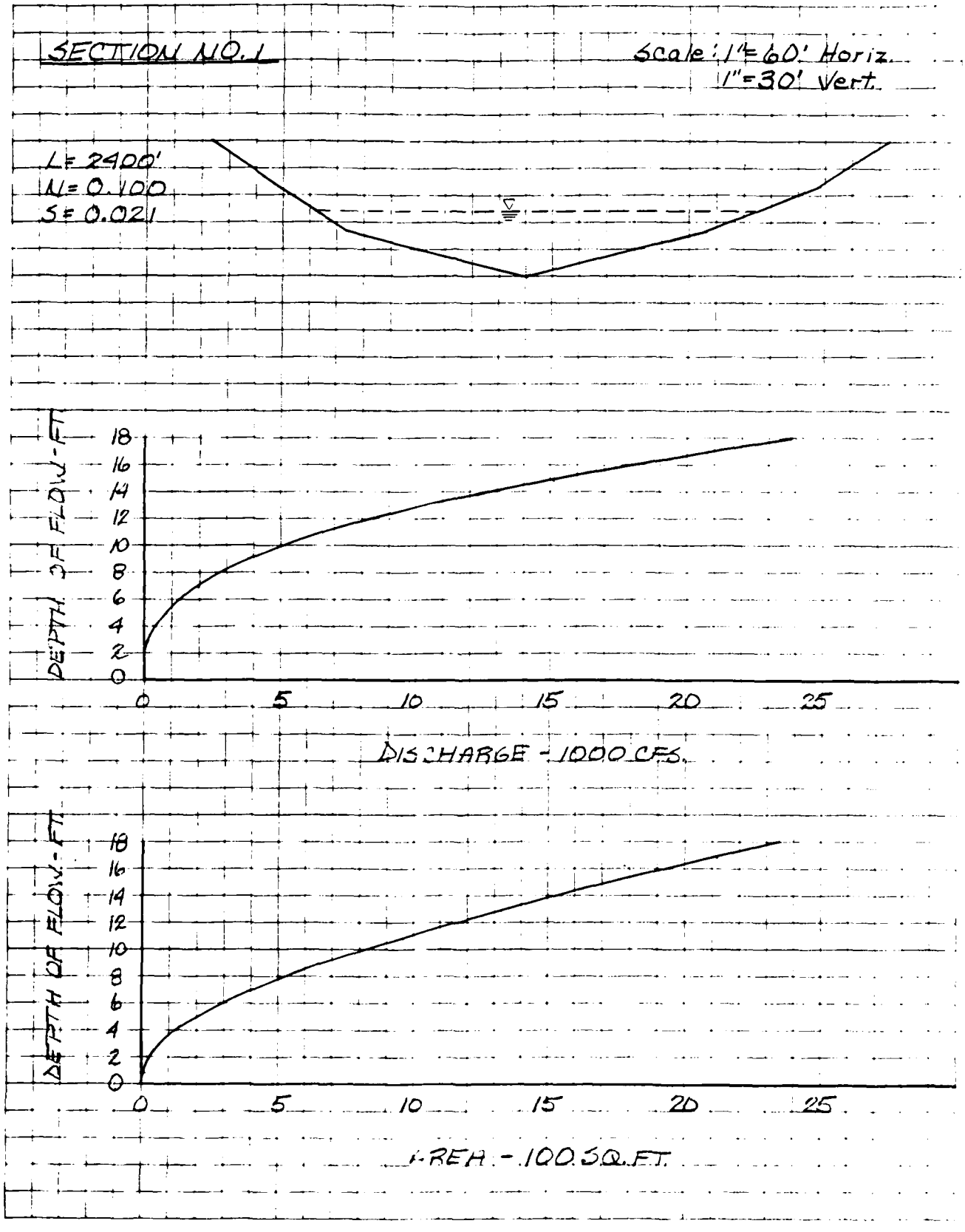
INFLOW INTO REACH=QP1= 22635 CFS
DEPTH OF FLOW=H1= 17.6 FT.
CROSS SECTIONAL AREA=A1= 2255 SQ. FT.
STORAGE IN REACH=V1= 124.3 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)= 12218 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 13.8 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 1466 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 80.7 AC. FT.

REACH OUTFLOW=QP2= 14042 CFS
DEPTH OF FLOW=H2= 14.6 FT.

REACH OUTFLOW=QP2= 14612 CFS
DEPTH OF FLOW=H2= 14.8 FT.

SUBJECT HATCH POND DAM - FLOOD ROUTING



SECTION NUMBER 2

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	34	17	.50	.0210	1.35	23
2.0	68	68	1.00	.0210	2.15	146
3.0	102	153	1.50	.0210	2.82	431
4.0	136	272	2.00	.0210	3.41	928
5.0	170	425	2.49	.0210	3.96	1683
6.0	204	612	2.99	.0210	4.47	2737
7.0	239	833	3.49	.0210	4.96	4129
8.0	273	1088	3.99	.0210	5.42	5895
9.0	307	1377	4.49	.0210	5.86	8070
10.0	341	1700	4.99	.0210	6.29	10688
11.0	360	2050	5.70	.0210	6.87	14075
12.0	379	2418	6.38	.0210	7.41	17913
13.0	398	2806	7.05	.0210	7.92	22208
14.0	417	3212	7.70	.0210	8.40	26970
15.0	436	3638	8.34	.0210	8.85	32207
16.0	455	4082	8.96	.0210	9.29	37931
17.0	474	4546	9.58	.0210	9.71	44152
18.0	494	5028	10.19	.0210	10.12	50879
19.0	513	5530	10.79	.0210	10.51	58125
20.0	532	6050	11.38	.0210	10.89	65900

MANNING COEFFICIENT=N=.1000
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 2400 FT.

INFLOW INTO REACH=QP1= 14612 CFS
DEPTH OF FLOW=H1= 11.1 FT.
CROSS SECTIONAL AREA=A1= 2101 SQ. FT.
STORAGE IN REACH=V1= 115.8 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)= 8347 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 9.1 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 1411 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 77.7 AC. FT.

REACH OUTFLOW=QP2= 9376 CFS
DEPTH OF FLOW=H2= 9.5 FT.

BY LBG DATE 8/21/80. **ROALD HAESTAD, INC.** SHEET NO 10 OF 25

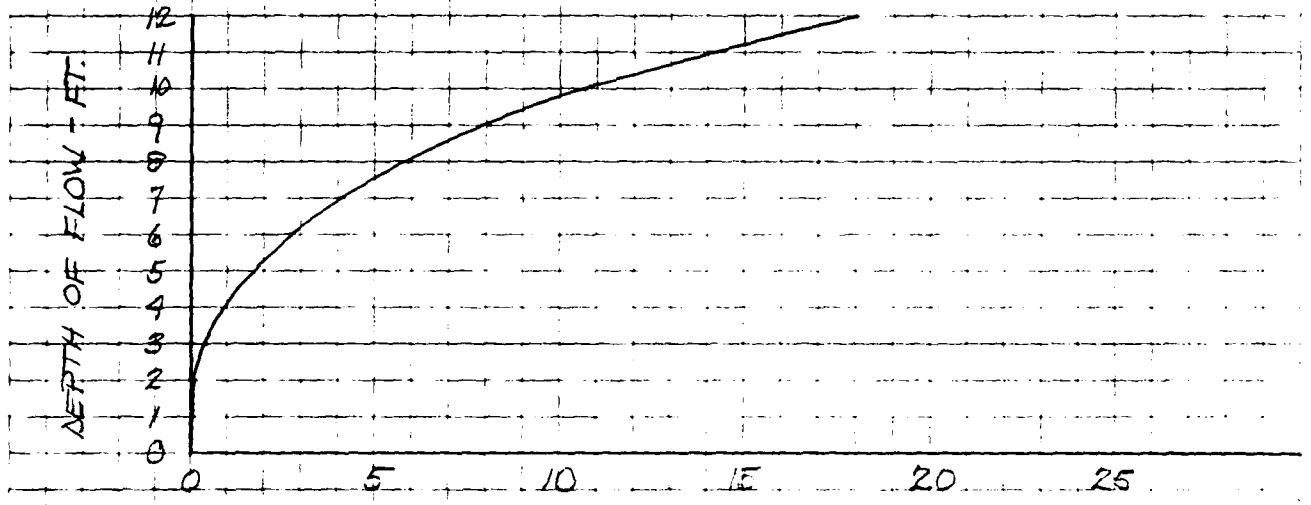
CKD BY DLS DATE 9/17/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

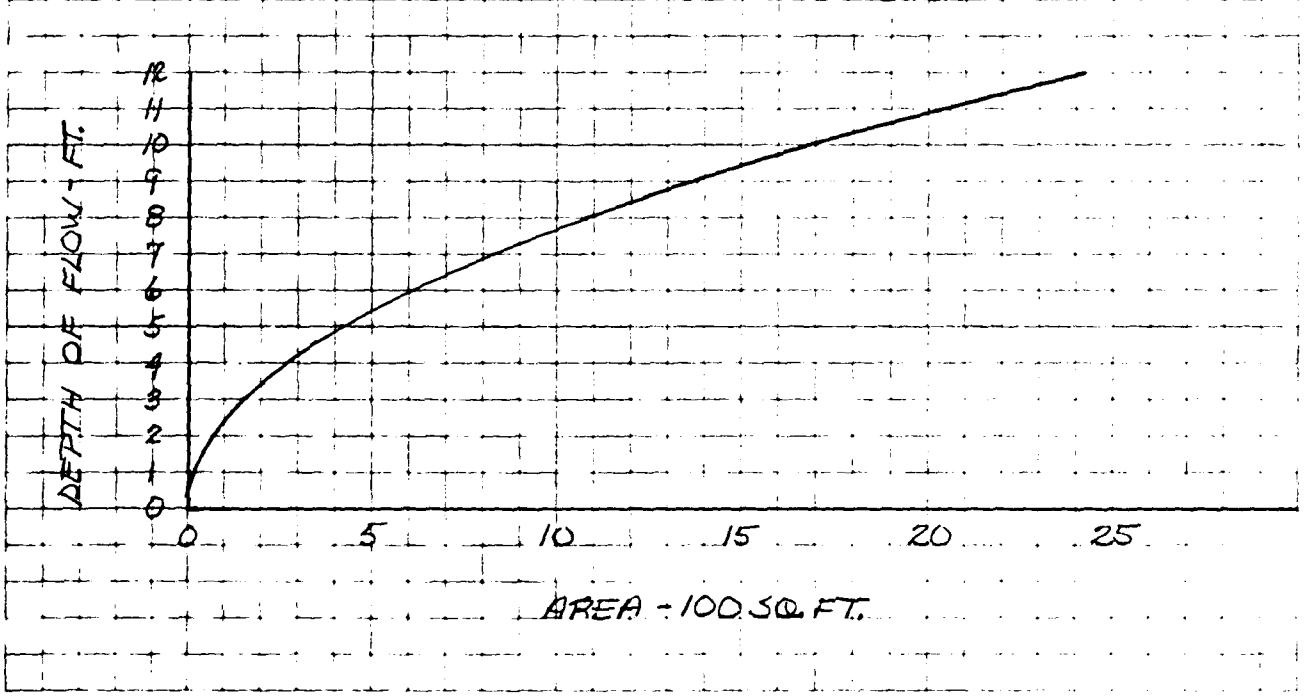
SUBJECT HATCH POND DAM - FLOOD ROUTING

SECTION NO. 2

Scale: 1" = 100' Horiz.
1" = 20' Vert.

L = 2400'
N = 0.10
S = 0.021





SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 3

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	34	17	.50	.0170	3.48	59
2.0	68	68	1.00	.0170	5.53	376
3.0	102	153	1.50	.0170	7.24	1108
4.0	136	272	2.00	.0170	8.78	2387
5.0	170	425	2.49	.0170	10.18	4328
6.0	204	612	2.99	.0170	11.50	7037
7.0	238	833	3.49	.0170	12.74	10615
8.0	273	1088	3.99	.0170	13.93	15156
9.0	307	1377	4.49	.0170	15.07	20748
10.0	341	1700	4.99	.0170	16.16	27479
11.0	372	2056	5.53	.0170	17.31	35576
12.0	403	2442	6.06	.0170	18.40	44938
13.0	434	2860	6.59	.0170	19.46	55632
14.0	465	3308	7.11	.0170	20.47	67724
15.0	496	3788	7.63	.0170	21.46	81279

MANNING COEFFICIENT=N=.0350
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 2300 FT.

INFLOW INTO REACH=QP1= 9376 CFS
DEPTH OF FLOW=H1= 6.7 FT.
CROSS SECTIONAL AREA=A1= 756 SQ. FT.
STORAGE IN REACH=V1= 39.9 AC. FT.

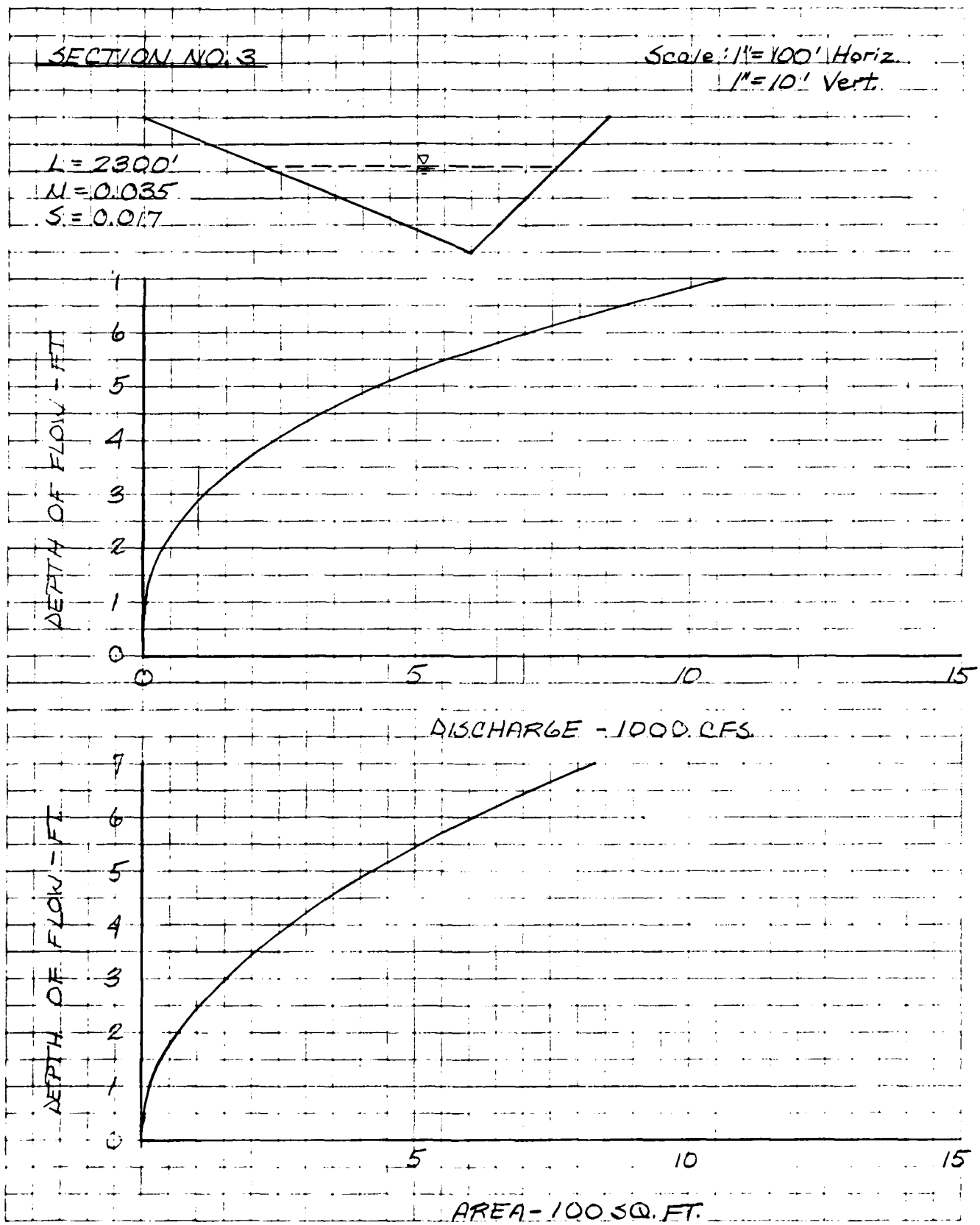
TRIAL REACH OUTFLOW=QP(TRIAL)= 7989 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 6.3 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 671 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 35.4 AC. FT.

REACH OUTFLOW=QP2= 8067 CFS
DEPTH OF FLOW=H2= 6.3 FT.

BY LBG DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 12 OF 25

CKD BY DLS DATE 9/17/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - FLOOD ROUTING



SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 4

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	85	43	.50	.0110	2.80	119
2.0	170	170	1.00	.0110	4.45	757
3.0	255	383	1.50	.0110	5.83	2231
4.0	340	680	2.00	.0110	7.07	4806
5.0	425	1063	2.50	.0110	8.20	8713
6.0	510	1530	3.00	.0110	9.26	14168
7.0	595	2083	3.50	.0110	10.26	21372
8.0	680	2720	4.00	.0110	11.22	30514
9.0	765	3443	4.50	.0110	12.13	41773
10.0	850	4250	5.00	.0110	13.02	55325

MANNING COEFFICIENT=N=.0350
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 2800 FT.

INFLOW INTO REACH=QP1= 8067 CFS
DEPTH OF FLOW=H1= 4.8 FT.
CROSS SECTIONAL AREA=A1= 999 SQ. FT.
STORAGE IN REACH=V1= 64.2 AC. FT.

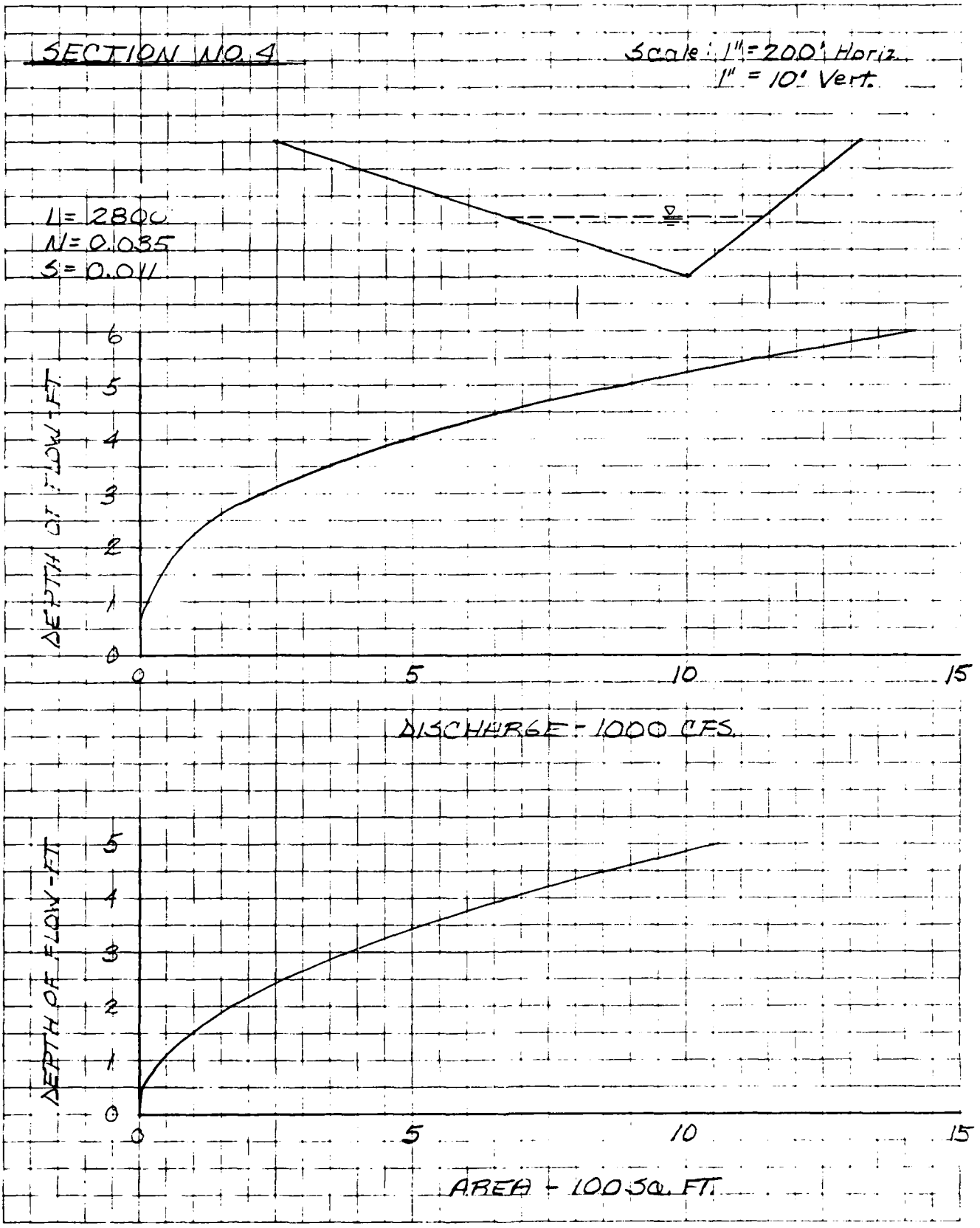
TRIAL REACH OUTFLOW=QP(TRIAL)= 6148 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 4.3 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 811 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 52.2 AC. FT.

REACH OUTFLOW=QP2= 6328 CFS
DEPTH OF FLOW=H2= 4.4 FT.

BY LRG DATE 9/6/80 **ROALD HAESTAD, INC.** SHEET NO 14 OF 25

CKD BY DLS DATE 9/11/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 44-067

SUBJECT HATCH POND DAM - FLOOD ROUTING



SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 5

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	34	17	.50	.0075	2.31	39
2.0	68	68	1.00	.0075	3.67	250
3.0	102	153	1.50	.0075	4.81	736
4.0	136	272	2.00	.0075	5.83	1586
5.0	170	425	2.50	.0075	6.77	2875
6.0	189	604	3.20	.0075	7.98	4823
7.0	207	801	3.87	.0075	9.06	7255
8.0	226	1016	4.50	.0075	10.03	10187
9.0	244	1249	5.12	.0075	10.92	13638
10.0	263	1500	5.71	.0075	11.75	17628
11.0	281	1769	6.30	.0075	12.54	22179
12.0	299	2056	6.87	.0075	13.28	27312
13.0	318	2361	7.43	.0075	14.00	33050
14.0	336	2684	7.98	.0075	14.68	39414
15.0	355	3025	8.53	.0075	15.35	46426

MANNING COEFFICIENT=N=.0350
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 2000 FT.

INFLOW INTO REACH=QP1= 6328 CFS
DEPTH OF FLOW=H1= 6.6 FT.
CROSS SECTIONAL AREA=A1= 726 SQ. FT.
STORAGE IN REACH=V1= 33.3 AC. FT.

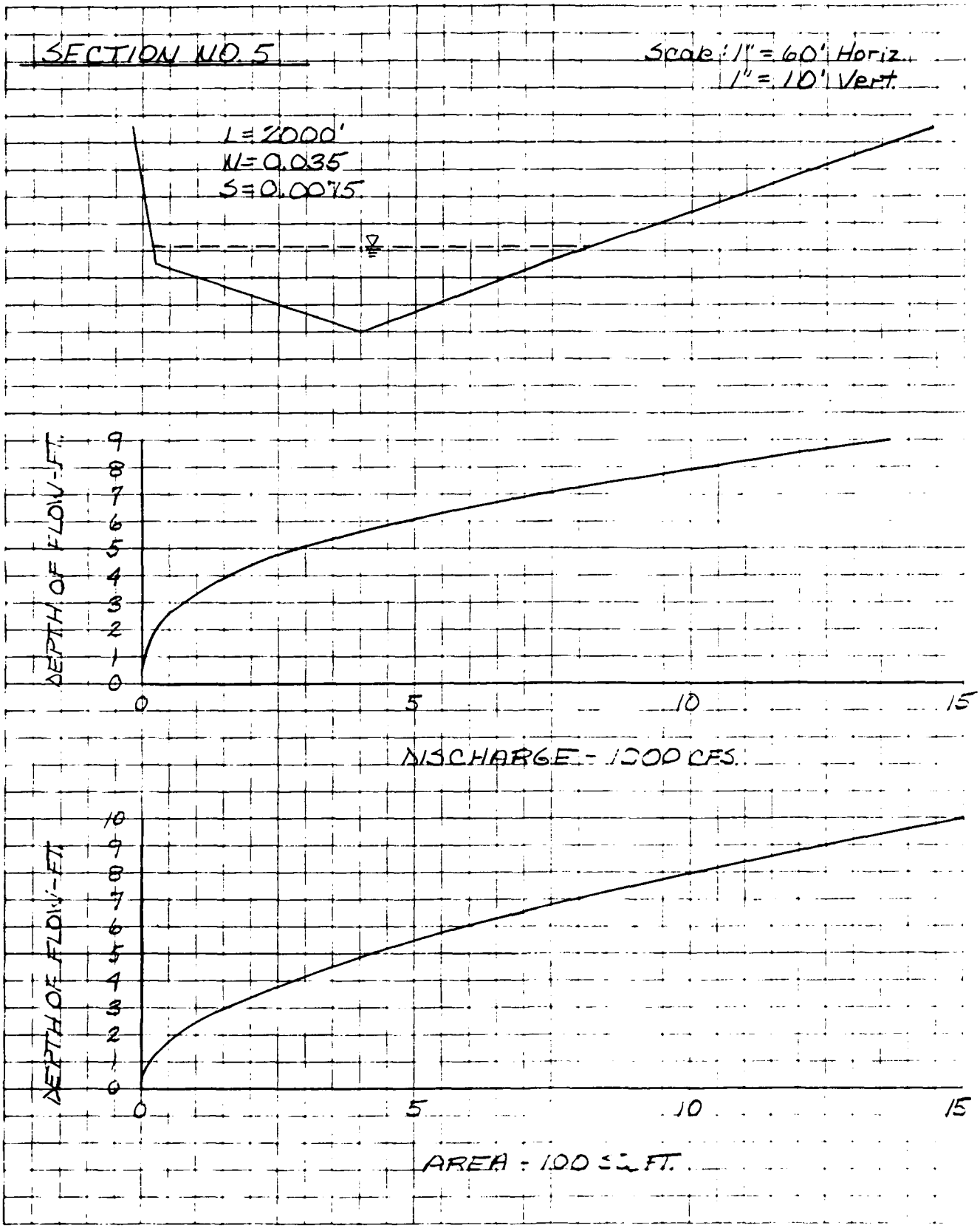
TRIAL REACH OUTFLOW=QP(TRIAL)= 5547 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 6.3 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 663 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 30.4 AC. FT.

REACH OUTFLOW=QP2= 5581 CFS
DEPTH OF FLOW=H2= 6.3 FT.

BY LBG DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 16 OF 25

CKD BY DLS DATE 9/17/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

SUBJECT HATCH POND DAM - FLOOD ROUTING



SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 6

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	25	13	.50	.0040	1.69	21
2.0	50	50	1.00	.0040	2.68	134
3.0	98	124	1.27	.0040	3.14	389
4.0	145	245	1.69	.0040	3.81	932
5.0	193	414	2.15	.0040	4.47	1849
6.0	240	630	2.62	.0040	5.11	3216
7.0	288	894	3.10	.0040	5.71	5107
8.0	335	1205	3.59	.0040	6.30	7590
9.0	383	1564	4.08	.0040	6.86	10727
10.0	431	1970	4.58	.0040	7.40	14580
11.0	478	2424	5.07	.0040	7.92	19208
12.0	526	2925	5.57	.0040	8.43	24666

MANNING COEFFICIENT=N=.0350
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 3200 FT.

INFLOW INTO REACH=QP1= 5581 CFS
DEPTH OF FLOW=H1= 7.2 FT.
CROSS SECTIONAL AREA=A1= 953 SQ. FT.
STORAGE IN REACH=V1= 70.0 AC. FT.

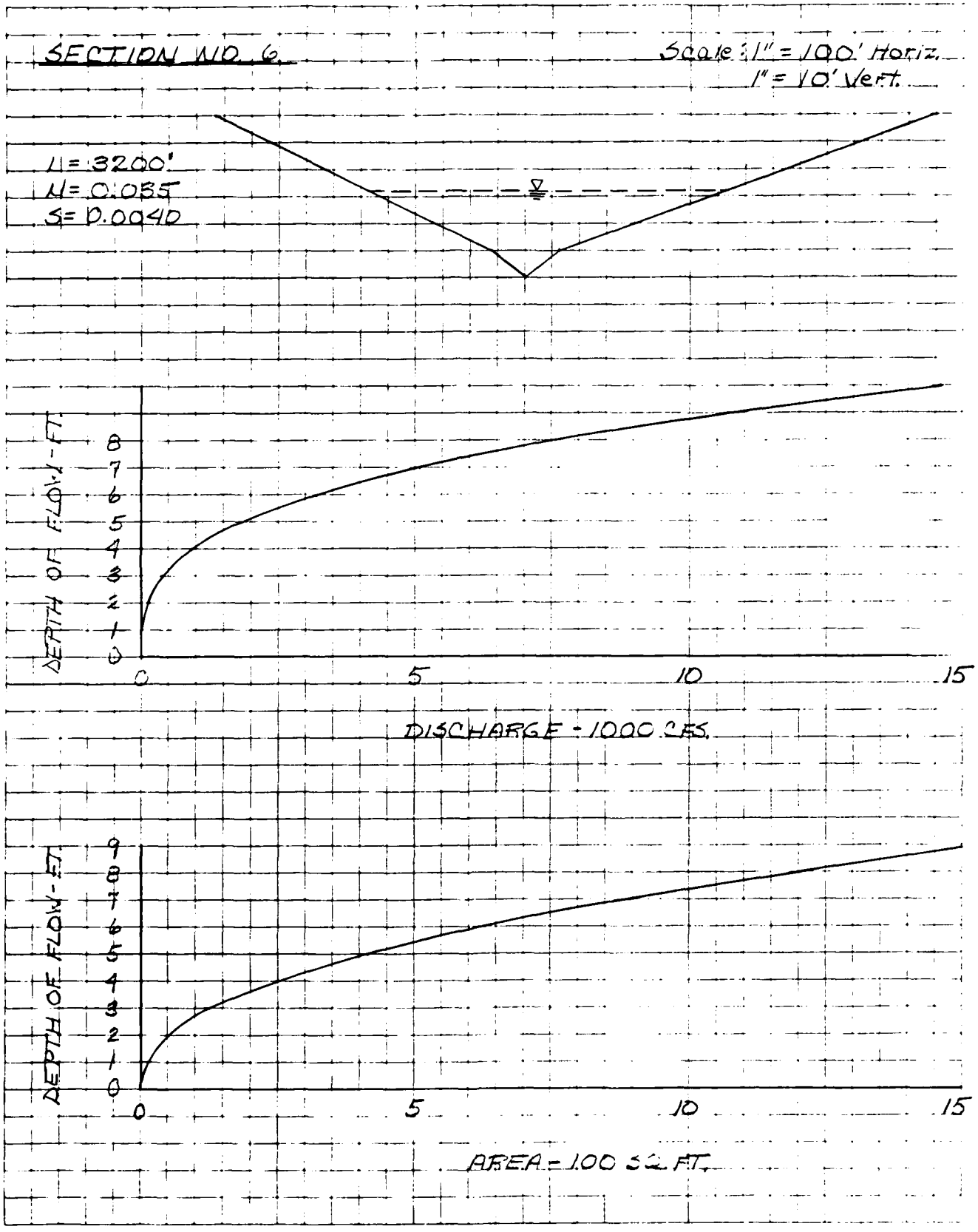
TRIAL REACH OUTFLOW=QP(TRIAL)= 4134 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 6.5 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 758 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 55.7 AC. FT.

REACH OUTFLOW=QP2= 4282 CFS
DEPTH OF FLOW=H2= 6.6 FT.

BY ..... DATE ..... **ROALD HAESTAD, INC.** SHEET NO. 18 OF 25

CKD BY DLS DATE 9/17/82 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO. 49-027

SUBJECT ... HATCH POND DAM - FLOOD ROUTING



SECTION NUMBER 7

STORAGE CAPACITY WITHIN REACH

HEIGHT (FEET)	SURFACE AREA (ACRES)	STORAGE VOLUME (ACRE-FEET)
1.0	.55	.3
2.0	1.10	1.1
3.0	1.65	2.5
4.0	2.20	4.4
5.0	2.75	6.9
6.0	5.07	10.8
7.0	7.38	17.0
8.0	9.70	25.5
9.0	12.01	36.4
10.0	14.33	49.6
11.0	16.64	65.0
12.0	18.96	82.8
13.0	21.27	103.0
14.0	23.59	125.4
15.0	25.90	150.1

STORAGE CAPACITY CALCULATED FROM SURFACE AREAS AT KNOWN ELEVATIONS.

SUBJECT HATCH POND DAM-FLOOD ROUTING AT TOP OF DAM

SECTION NUMBER 7

TOTAL SECTION

H	W	A	R	S	V	Q
1.0	26	13	.50	.0036	1.60	21
2.0	52	52	1.00	.0036	2.54	132
3.0	78	117	1.49	.0036	3.33	389
4.0	104	208	1.99	.0036	4.03	839
5.0	131	325	2.49	.0036	4.68	1521
6.0	178	479	2.69	.0036	4.93	2360
7.0	225	679	3.02	.0036	5.32	3615
8.0	272	927	3.41	.0036	5.77	5346
9.0	319	1221	3.83	.0036	6.23	7613
10.0	366	1563	4.27	.0036	6.70	10476
11.0	413	1951	4.72	.0036	7.17	13992
12.0	460	2387	5.19	.0036	7.63	18216
13.0	507	2869	5.66	.0036	8.09	23202
14.0	554	3399	6.13	.0036	8.53	29002
15.0	601	3975	6.61	.0036	8.97	35664

MANNING COEFFICIENT=N=.0350
STORAGE AT TIME OF FAILURE=S= 270 AC. FT.
LENGTH OF REACH=L= 1400 FT.

INFLOW INTO REACH=QP1= 4282 CFS
DEPTH OF FLOW=H1= 7.4 FT.
CROSS SECTIONAL AREA=A1= 774 SQ. FT.
STORAGE IN REACH=V1= 20.3 AC. FT.

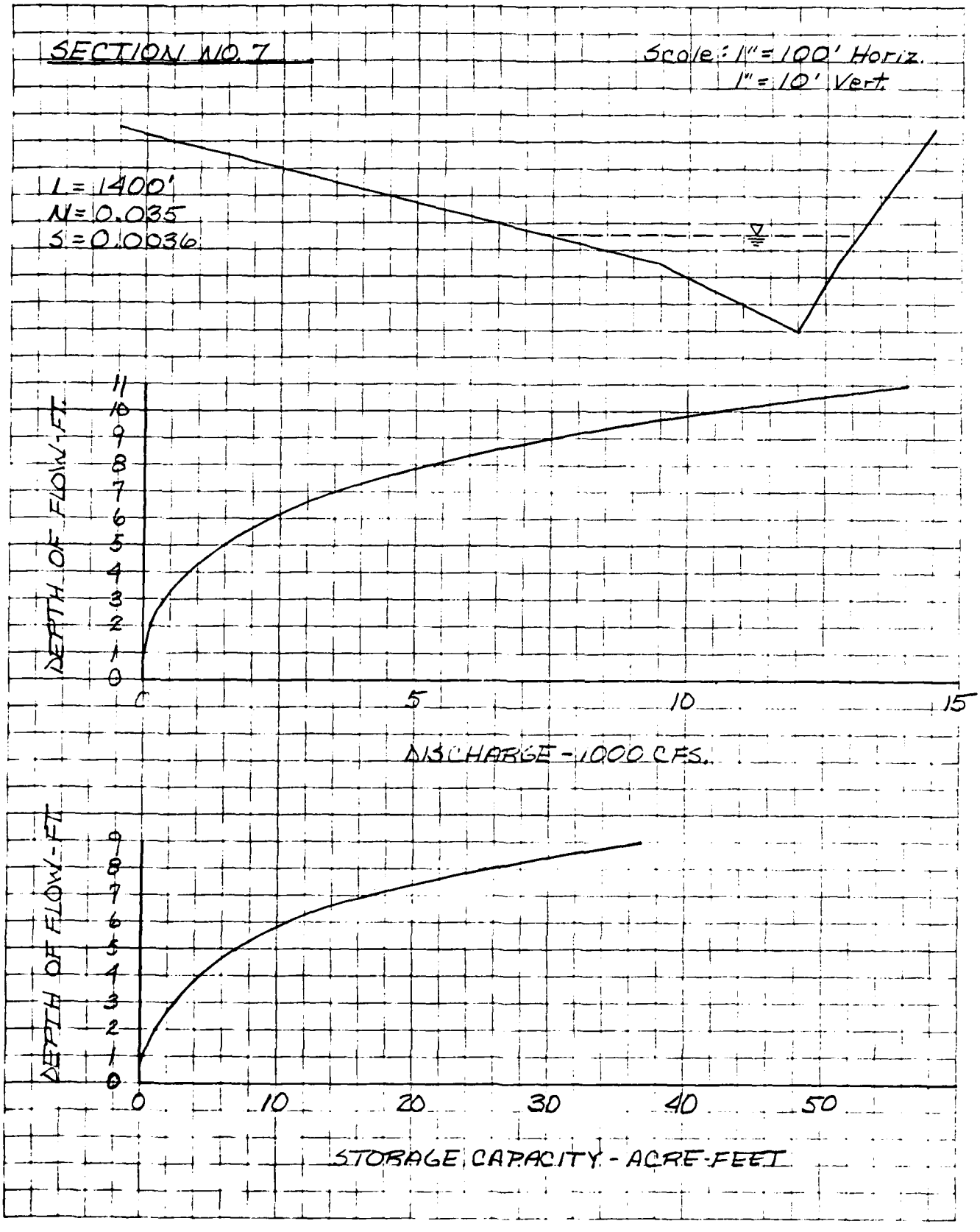
TRIAL REACH OUTFLOW=QP(TRIAL)= 3960 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 7.2 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 728 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 18.7 AC. FT.

REACH OUTFLOW=QP2= 3973 CFS
DEPTH OF FLOW=H2= 7.2 FT.

BY ABG DATE 9/21/80. **ROALD HAESTAD, INC.** SHEET NO. 21 OF 25

CKD BY DL DATE 9/17/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO. 49-027

SUBJECT HATCH POND DAM - FLOOD ROUTING



SECTION NUMBER 8

ROUTE 41

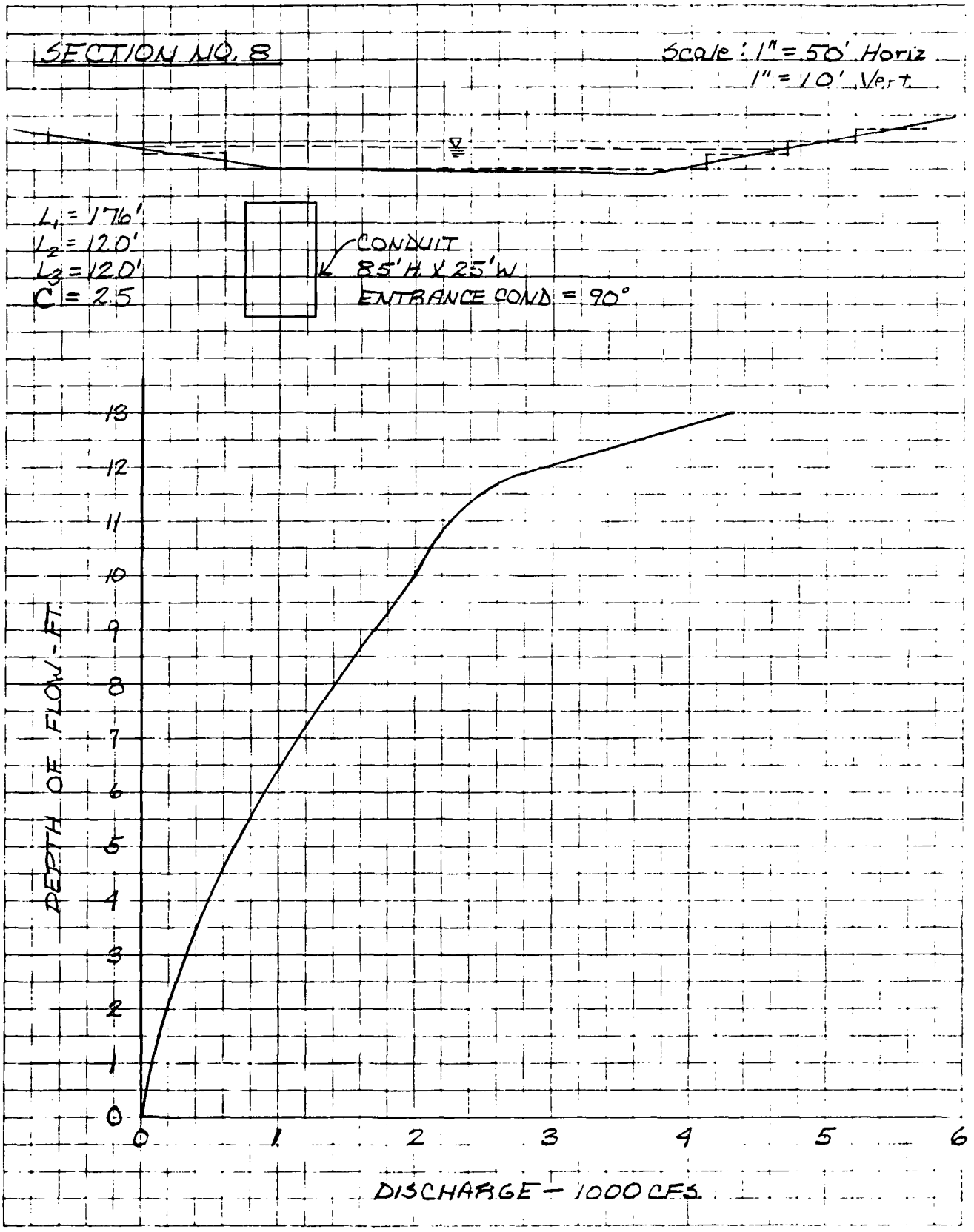
HEIGHT ABOVE INVERT (FEET)	DISCHARGE CAPACITY CONDUIT (CFS)	SPILLWAY (CFS)	TOTAL (CFS)
1.0	100	0	100
2.0	200	0	200
3.0	344	0	344
4.0	488	0	488
5.0	681	0	681
6.0	875	0	875
7.0	1150	0	1150
8.0	1425	0	1425
9.0	1713	0	1713
10.0	2000	0	2000
11.0	2250	0	2250
12.0	2500	473	2973
13.0	2813	1498	4311
14.0	3125	3075	6200
15.0	3208	5242	8450
16.0	3292	8041	11332
17.0	3375	11433	14808
18.0	3542	15391	18932
19.0	3708	19965	23673
20.0	3875	25066	28941

REACH OUTFLOW=QP2= 3973 CFS
HEIGHT ABOVE CONDUIT INVERT=H2= 12.7 FT.

BY LBG DATE 8/21/80 **ROALD HAESTAD, INC.** SHEET NO 23 OF 25

CKD BY DLS DATE 9/11/80 CONSULTING ENGINEERS 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-027

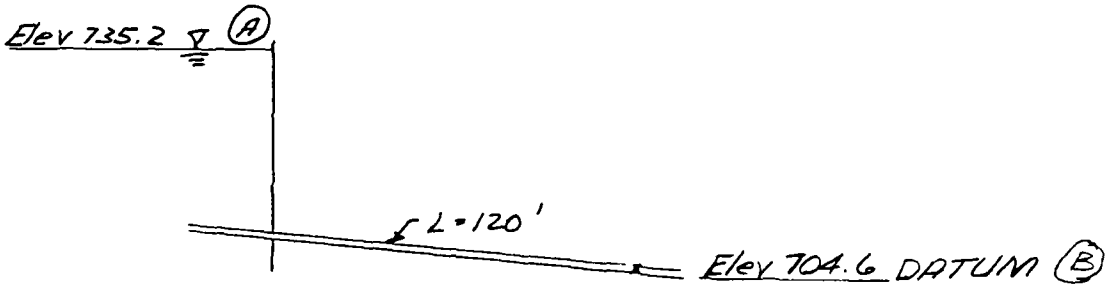
SUBJECT HATCH POND DAM - DEPTH OF FLOW



Blowoff consists of a 12" CIP approximately 120' long

Top of dam Elev = 735.2
Inv of blowoff Elev = 704.6

Head losses: 1) Entrance - projecting $= K V_2^2/2g$ $(K=1)$
2) In the pipe $= f \frac{L}{D} V_2^2/2g$
3) Gate Valve $= K V_2^2/2g$ $(K=0.25)$



$$P_A + V_A^2/2g + Z_A = P_B + V_B^2/2g + Z_B + H_{LA-B}$$

$$0 + 0 + 30.6 = 0 + V_B^2/2g + 0 + \left(f\left(\frac{120}{1}\right) + 1.25\right) V_B^2/2g$$

$$30.6 = (120f + 2.25)\, V_B^2/2g$$

Solve by trial & error:

Assume $V_B = 20$ ft/sec $\longrightarrow f = 0.0360$ $\therefore V_B = 17.3$ ft/sec
" $V_B = 17$ ft/sec $\longrightarrow f = 0.0363$ $\therefore V_B = 17.3$ ft/sec

Discharge Capacity at top of dam:

$$Q = V_B A$$
$$= 17.3 \text{ ft/sec} \times (\pi \cdot (1)^2/4)$$
$$= 13.6 \text{ use } 14 \text{ cfs}$$

PLANIMETER READINGS:
(Scale: 1" = 2000')

1.) WATERSHED: THIRD 84.87 SQ. IN. 13.87
FIRST 57.13 SQ. IN 13.89
START 43.24 SQ. IN.

$13.87\ IN^2 \times \frac{(2000\ FT.)^2}{IN.^2} \times \frac{1\ ACRE}{43,560\ FT.^2} = 1274\ ACRES = 1.99$
USE 2.0 SQ. MI.

2) ELEV. 532 (WATER SURFACE): THIRD 25.53 SQ. IN. .21
FIRST 25.11 SQ. IN. .21
START 24.90 SQ. IN.

$.21\ IN^2 \times \frac{(2000\ FT.)^2}{IN.^2} \times \frac{1\ ACRE}{43,560\ FT.^2} = 19\ ACRES$

3) CONTOUR 740: THIRD 67.53 SQ. IN. .53
FIRST 66.47 SQ. IN. .54
START 65.93 SQ. IN.

$.53\ IN^2 \times \frac{(2000\ FT.)^2}{IN.^2} \times \frac{1\ ACRE}{43,560\ FT.^2} = 49\ ACRES$

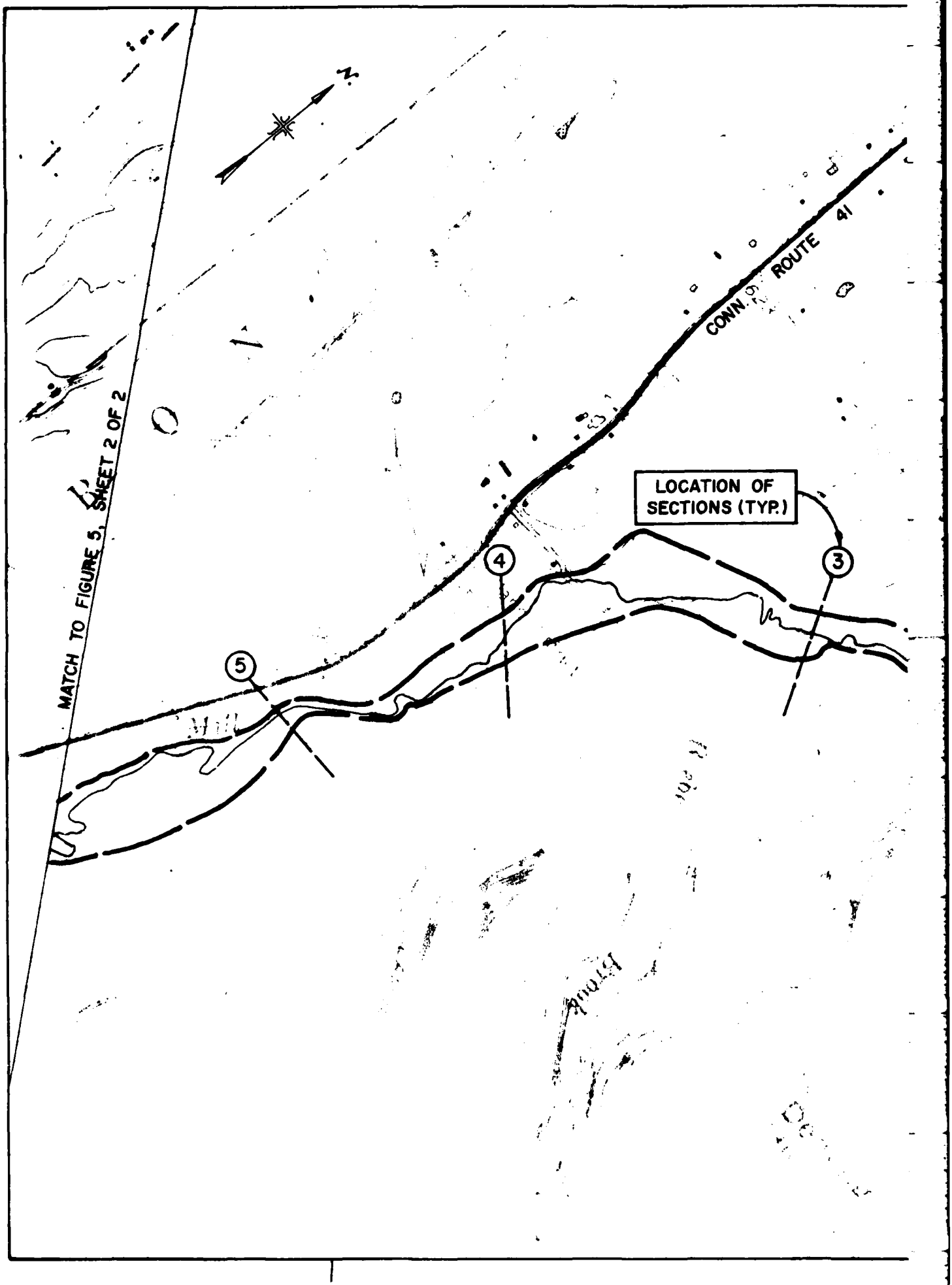
SECTION 7 (Scale: 1" = 1000')

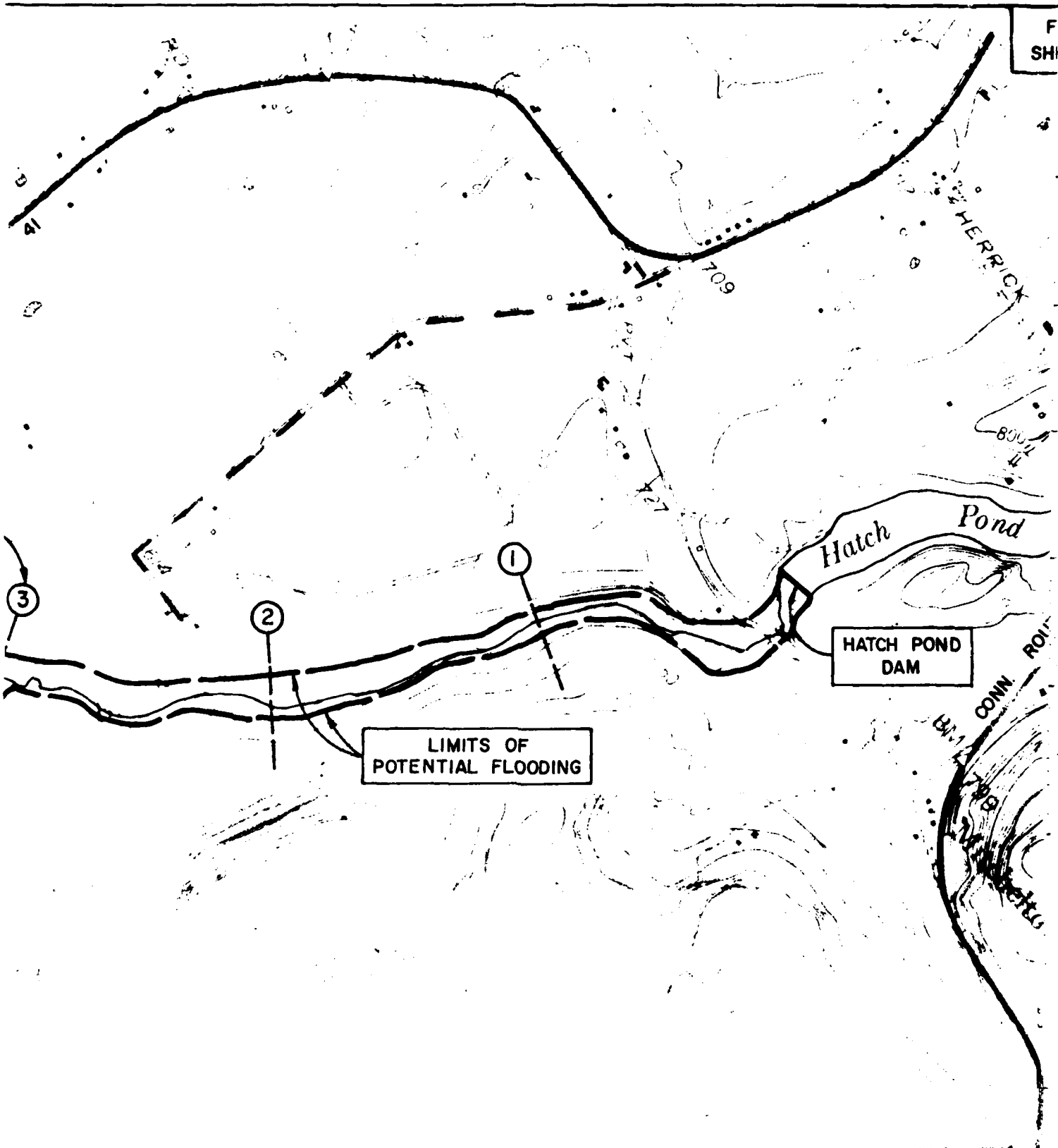
1.) CONTOUR 520: THIRD 11.10 SQ. IN. 0.12
FIRST 10.86 SQ. IN. 0.12
START 10.74 SQ. IN.

$0.12\ IN^2 \times \frac{(1000\ FT.)^2}{IN.^2} \times \frac{1\ ACRE}{43,560\ FT.^2} = 2.75\ ACRES$

2.) CONTOUR 530: THIRD 16.29 SQ. IN. 1.13
FIRST 14.02 SQ. IN. 1.13
START 12.89 SQ. IN.

$1.13\ IN^2 \times \frac{(1000\ FT.)^2}{IN.^2} \times \frac{1\ ACRE}{43,560\ FT.^2} = 25.9\ ACRES$


MATCH TO FIGURE 5, SHEET 2 OF 2
CONN. ROUTE 41
LOCATION OF SECTIONS (TYP.)
3
4
5



ROALD HAESTAD, INC. *CONSULTING ENGINEERS* WATERBURY, CONNECTICUT	U.S. ARMY ENGINE *CORPS O* WALTH

NATIONAL PROGRAM OF INSPECTION O

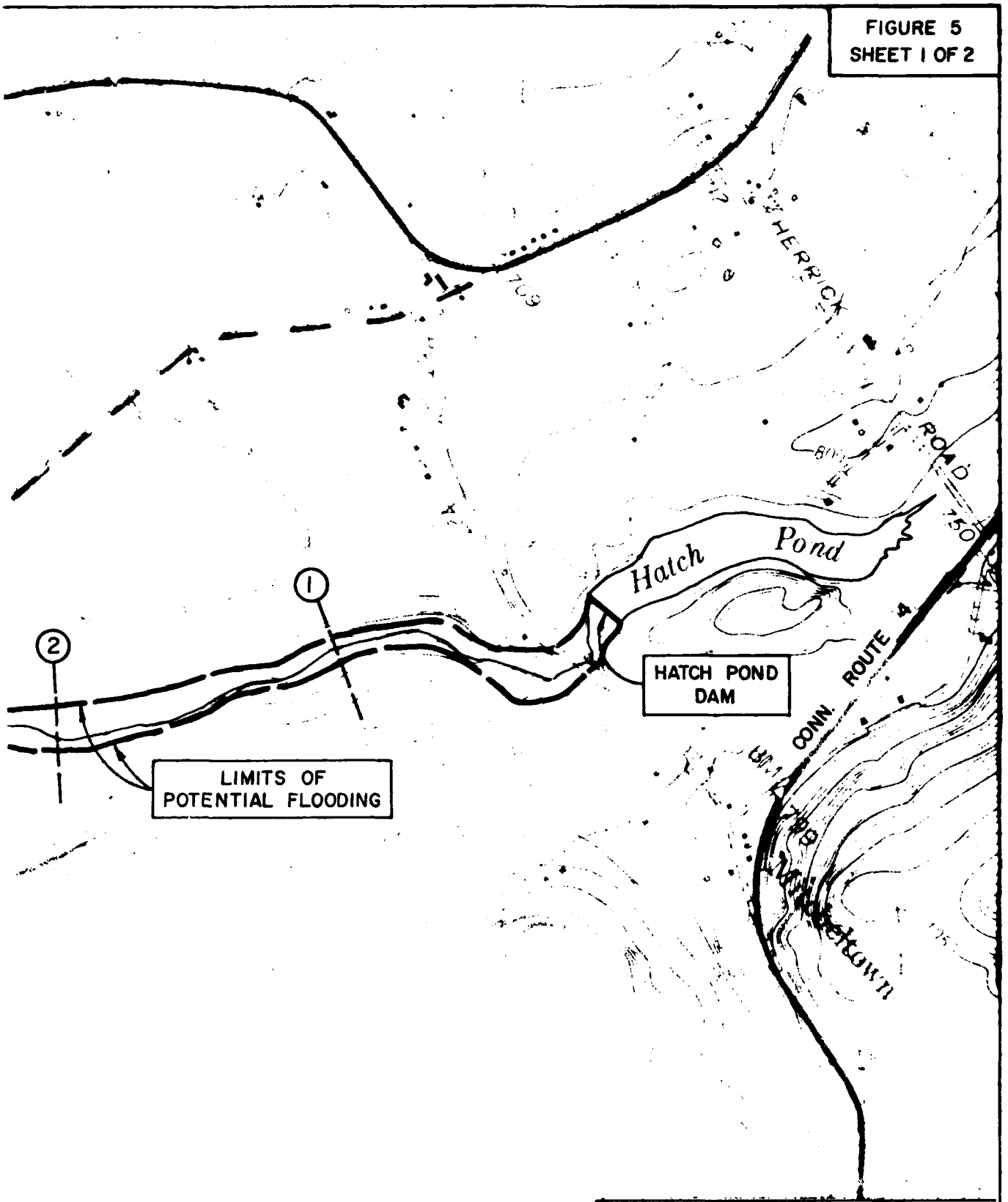
LIMIT OF POTENTIAL

HATCH POND DA

SHARON, CONNECTIC

DRAWN	CHECKED	APPROVED	SCALES 1"
JRS	RGL	RH	DATE SEP

FIGURE 5
SHEET 1 OF 2



ROALD HAESTAD, INC *CONSULTING ENGINEERS* WATERBURY, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND *CORPS OF ENGINEERS* WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

LIMIT OF POTENTIAL FLOODING

HATCH POND DAM

SHARON, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALES 1" = 1000'
JRS	RGL	RH	DATE SEPT 1980 PAGE D-27

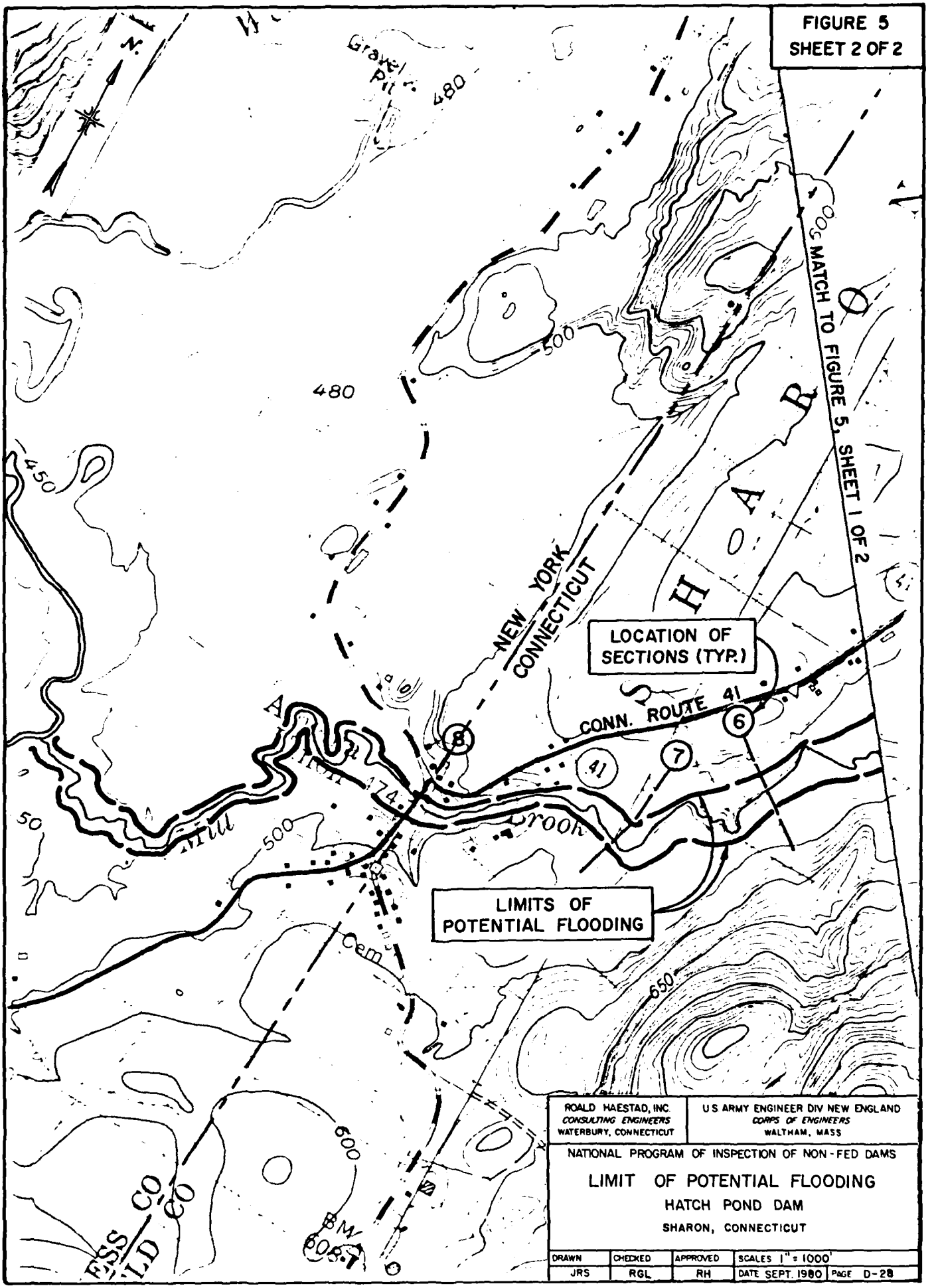


FIGURE 5
SHEET 2 OF 2
MATCH TO FIGURE 5, SHEET 1 OF 2
NEW YORK
CONNECTICUT
LOCATION OF SECTIONS (TYP.)
CONN. ROUTE 41
LIMITS OF POTENTIAL FLOODING
Gravel Pit
480
500
450
650
600
Mill
Brook
Cem
41
6
7
8
ROALD HAESTAD, INC.
CONSULTING ENGINEERS
WATERBURY, CONNECTICUT
U.S. ARMY ENGINEER DIV NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS
LIMIT OF POTENTIAL FLOODING
HATCH POND DAM
SHARON, CONNECTICUT
DRAWN JRS
CHECKED RGL
APPROVED RH
SCALES 1" = 1000'
DATE SEPT. 1980
PAGE D-28

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY / MO / YR
CT	603	NED	CT	005	06				HATCH POND DAM	4151.7	7328.2	29SEP80

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	HATCH POND

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	10	MILL BROOK	AMENIA UNION	3	500

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	(27) IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)
REPG	1900	R	31	31	270	190

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
NED	N	N	N	N	

(28) REMARKS
20 ESTIMATE

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) SPILLWAY TYPE	(32) SPILLWAY WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) POWER CAPACITY PROPOSED (MW)	(37) NAVIGATION LOCKS NO.	(38) LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
1	540	U	42	780	20000											

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
EST OF HAROLD A HATCH	UNKNOWN	UNKNOWN

(49) REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	CT DEP	CT DEP

(52) INSPECTION BY	(53) INSPECTION DATE DAY / MO / YR	(54) AUTHORITY FOR INSPECTION
HOALD HAESTAD INC	29JUL80	PL 92-367

(55) REMARKS

END

FILMED

9-84

DTIC